ORDER NO. VKD86030980C8

Service Manual

Remote Control Unit
WV-RC33

RCU/Gen-Lock Adaptor
WV-AD33

AC Adaptor/Charger
WV-PS31

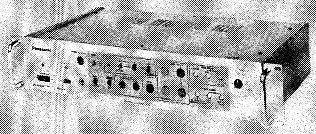
Battery Pack
WV-PS33

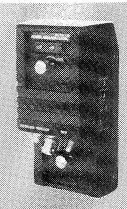
Chest Pad
WV-Q30

Tripod Mounting Adaptor
WV-Q36

5″ Viewfinder
WV-VF65

Battery Pack
WV-PS60


WV-RC33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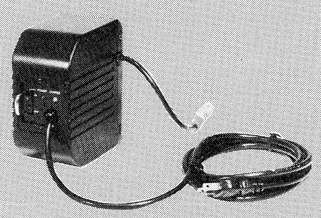
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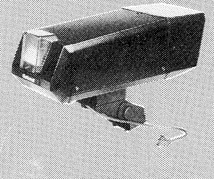
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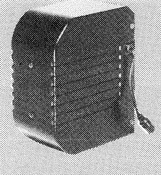
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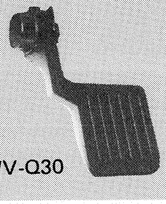
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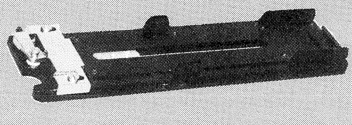
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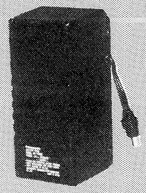
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National/Panasonic

Matsushita Electric Trading Co., Ltd.
P.O. Box 288, Central Osaka Japan

SPECIFICATIONS

Remote Control Unit (RCU) WV-RC33

Power Source :	WV-RC33/B 240V AC, 50Hz, 42W WV-RC33/C,G 220V AC, 50Hz, 42W WV-RC33NA 240V AC, 50Hz, 42W WV-RC33N 220V AC, 50Hz, 42W
Power Supply :	12V - 22V DC, 2.5A - 1.6A for camera head
Video Input :	1.0 Vp-p PAL composite/75 ohms (14P camera connector)
Video Output :	1.0 Vp-p PAL composite/75 ohms x 2 (BNC connectors)
CHECK Display :	Superimposed to Video Output-2(switchable)
Gen-Lock Input :	1.0 V p-p PAL composite or black burst signal/75 ohms or Hi-Z looping through x 1 (BNC connectors)
Subcarrier Phase for Gen-Lock :	Adjustable more than 360°
Horizontal Phase for Gen-Lock :	Adjustable from -0.1μ sec to $+3.5\mu$ sec
Aux (Line View) Input :	1.0 Vp-p PAL composite/75 ohms or Hi-Z looping through x 1 (BNC connectors)
Maximum Studio Cable Length :	100 m (300 ft) with cable compensator
Tally & Intercom :	4 pin connector
Switches :	Power ON/OFF, AC/DC Selection, Color Bar/Camera Selection, White Balance Selection, AWC Selection, Auto White/Auto Black Set, Auto Centering Set, Cable Compensation, CHECK ON/OFF, CHECK
Controls :	R and B Gain, R and B Pedestal, Total Pedestal, Subcarrier Coarse and Fine Phase, Horizontal Phase, Total Gain Fine, Chroma Gain Fine, Intercom Level, Iris Auto/Manual-Iris Level
Ambient Operating Temperature :	$-10°C \sim +45°C$
Ambient Operating Humidity :	Less than 90%
Dimensions :	480 (W) x 88 (H) x 225 (D) mm
Weight :	6.4 kg

RCU/Gen-lock Adaptor WV-AD33

Power Source :	Supplied from camera through 32-pin connector
Gen-Lock Input :	1.0Vp-p video composite or black burst signal/75 ohms x 1 (BNC connector)
Subcarrier Phase for Gen-Lock :	Adjustable more than 360°
Horizontal Phase for Gen-Lock :	Adjustable from -0.1μsec to $+3.5\mu$sec
Switches :	Subcarrier Phase Coarse
Controls :	Subcarrier Phase Fine, Horizontal Phase, Intercom Level
Connectors :	Gen-lock Input, RCU, Intercom
Dimensions :	76 (W) x 161 (H) x 68 (D) mm
Weight :	0.5 kg

AC Adaptor/Charger WV-PS31

Power Source :	WV-PS31/B : AC adaptor : 240V AC, 50Hz, 33 Watts Charger : 240V AC, 50Hz, 26 Watts WV-PS31/C,G : AC adaptor : 220V AC, 50Hz, 33Watts Charger : 220V AC, 50Hz, 26 Watts WV-PS31NA : AC adaptor : 240V AC, 50Hz, 33 Watts Charger : 240V AC, 50Hz, 26 Watts WV-PS31N : AC adaptor : 220V AC, 50Hz, 33Watts Charger : 220V AC, 50Hz, 26 Watts
Power Supply :	+13V DC, 1.6A
Charging Output :	+16V DC, 1A at quick charge mode
Ambient Operating Temperature :	$-10°C \sim +45°C$
Ambient Operating Humidity :	Less than 90%
Dimensions :	76 (W) x 145 (H) x 120.5 (D) mm
Weight :	1.1 kg

5″ Electronic Viewfinder WV-VF65

Visual Size (underscan) :	4.5″ actual visual size, measured diagonally
Power Source :	+12V DC (Supplied from camera head)
Power Consumption :	13.2 watts (12V DC, 1.1A)
Horizontal Resolution :	500 lines at center
Switches :	Tally ON/OFF, Peaking ON/OFF
Controls :	Contrast, Brightness
Display :	PAL signal
Indicator :	Level Indicator. (Zebra pattern) Tally Indicator Tally Lamp
EVF Display/Alarm :	BACKUP (backup battery), WHITE (white balance) LIGHT (low light)
Dimensions :	156(W) x 213(H) x 362(D)mm
Weight :	2.85 kg

Battery Pack WV-PS33

Power Supply :	+12V DC, 3.5Ah nominal
Operating Time :	Approximately 2 hours
Ambient Operating Temperature :	−10°C ~ +45°C
Ambient Operating Humidity :	Less than 90%
Dimensions :	76 (W) x 145 (H) x 120.5 (D) mm
Weight :	4.4 lbs (2 kg)

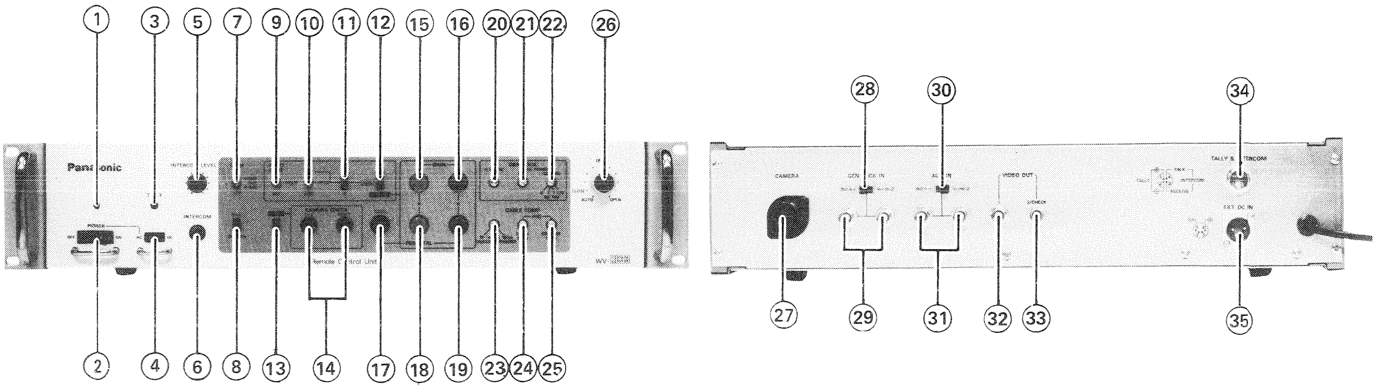
Battery Pack WV-PS60

Power Supply :	+12V DC, 1.65Ah nominal
Operating Time :	Approximately 1 hour
Ambient Operating Temperature :	−10°C ~ +45°C
Ambient Operating Humidity :	Less than 90%
Dimensions :	71.5(W) x 145(H) x 73(D) mm
Weight :	1 kg

Weight and dimensions shown are approximate.
Specifications are subject to change without notice.

MAJOR OPERATING CONTROLS AND THEIR FUNCTIONS

Remote Control Unit (RCU) WV-RC33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Remote Control Unit
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CAMERA
VIDEO OUT
TALLY & INTERCOM
EXT. DC IN
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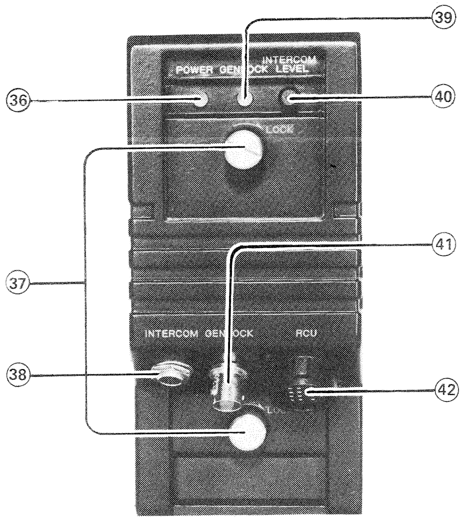
RCU/Gen-lock Adaptor WV-AD33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POWER GENLOCK
INTERCOM LEVEL
LOCK
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INTERCOM GENLOCK RCU
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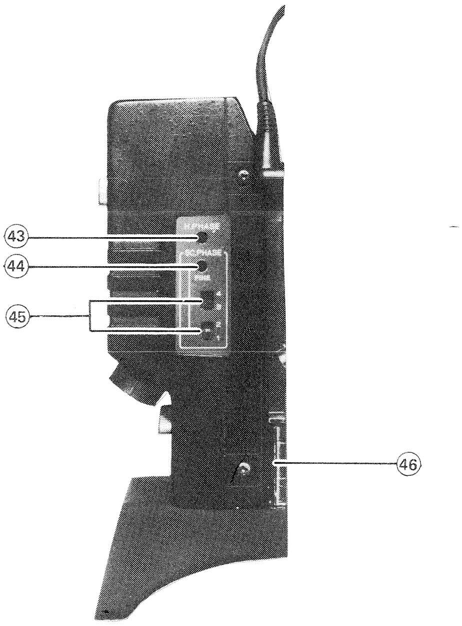
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H.PHASE
SC.PHASE
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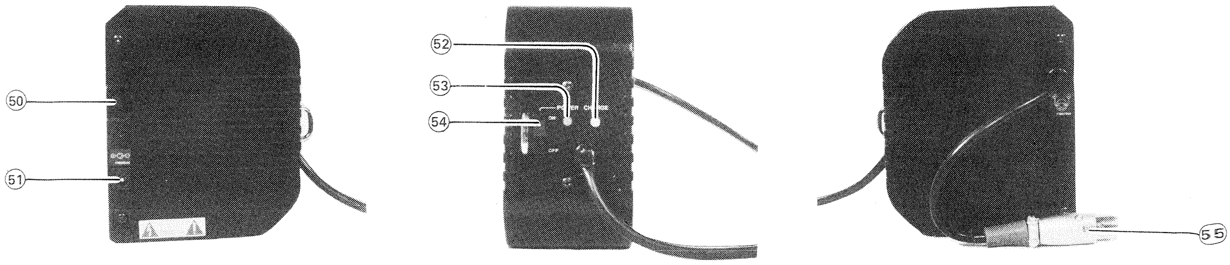
AC Adaptor/Charger WV-PS31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POWER
CHARGE
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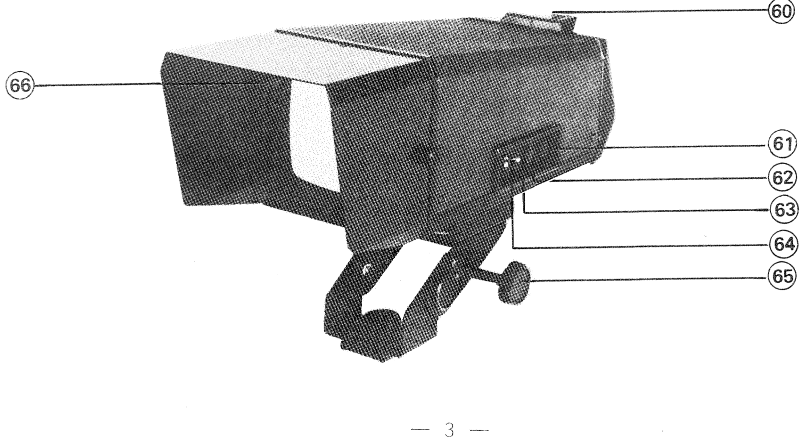
5" Viewfinder WV-VF65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Remote Control Unit (RCU)
WV-RC33

1 **Power Indicator**
This indicator lights up whenever the unit is operated.

2 **Power Switch (POWER ON/OFF)**
This switch activates power for the RCU.

3 **Tally Indicator (TALLY)**
When RCU is used in conjunction with a special effects generator, the tally indicators on the viewfinder and RCU inform to the camera operator, RCU operator and others concerned that the camera system is actually recording the scene.

4 **AC/DC Selection Switch (AC/DC)**
This switch selects the AC or DC power source for the RCU.

5 **Intercom Level Control (INTERCOM LEVEL)**
Turn this control to obtain optimum sound level for the headset connected to the Intercom Jack (6).

6 **Intercom Jack (INTERCOM)**
This is used for communication between camera operator and RCU operator in system operation with special effects generator.

7 **High Gain Selection Switch (+6dB/0dB/+12dB)**
Normally set this switch to 0dB position. Positions +6dB and +12dB increase the video output amplitude for dark scenes and are equivalent to opening the lens iris one or two F stops.

8 **Color Bar/Camera Selection Switch (BAR/CAMERA)**
When used in a system, this switch can select the camera mode or color bar mode regardless of the Selection Switch on the camera.

BAR : The EBU colour bar is provided from the Video Output Connectors (32& 33) on the RCU.

CAMERA : The system is in operating condition after necessary adjustments.

9 **Auto Centering Set Switch (AUTO CENT HOLD/SET)**
This switch sets the horizontal and vertical centering of the red and blue picture to coincide with the green picture. Centering setting is necessary when CENT blinks in the viewfinder and the CHECK video monitor connected to the Video Output 2/CHECK Connector (33)

10 **Auto White/Auto Black Set Switch (AWC SET/HOLD/ABC)**
This switch sets the white balance and black balance automatically as follows;

AWC SET: This position is used for setting the white balance when the White Balance Selection Switch (12) is set to the AWC position. White balance setting is necessary when WHITE, AWC 1 or AWC 2 blinks in the viewfinder and the CHECK video monitor connected to the Video Output 2/Check Connector (33)
White balance for two different light sources such as indoor and outdoor can be set by setting the AWC Selection Switch (11) to AWC 1 or 2.

HOLD : This position holds the white balance and black balance set at AWC SET and ABC position for a long period of time.

ABC : This position is used for setting the black balance when the White Balance Selection Switch (12) is set to the ATW or AWC position. Black balance setting is necessary when BLACK blinks in the viewfinder and the CHECK video monitor.

Note : Since the black balance at the 0dB and +12dB mode of the high gain selection switch is set alternately by selecting the 0dB and +12dB position automatically, the picture on the viewfinder and the video monitor flashes while the black balance is being set.

11 **AWC Selection Switch (AWC 1/2)**
The white balance for two different light sources such as indoor and outdoor can be set by selecting this switch to AWC 1 or 2 when the White Balance Selection Switch (12) is in the AWC position.

12 **White Balance Selection Switch (ATW/AWC/MANUAL)**
This switch selects the operational condition of white balance as follows;

ATW : The white balance is automatically set by detecting the characteristic/color temperature of the light source with the ATW sensor and controls the gain of red and blue signal even if the characteristic/color temperature changes.

Note : (1) The Filter wheel must be set to position 1 in this operation.
(2) If the camera is used with the lens other than WV-LZ33/10 outdoor in the ATW position,

the lens iris may hunt continuously. In this case, the ND filter which reduces the light intensity more than 1/8 should be mounted on the lens.

AWC : The white balance can be set automatically by the Auto White/Auto Black Set Switch (10). The white balance for two different light sources such as indoor and outdoor can be set by setting the AWC Selection Switch (11) to AWC 1 or 2.

MANUAL : The white balance and black balance can be adjusted by the Red and Blue Gain Control (15 & 16) and the Red and Blue Pedestal Control (18 & 19).

Note :
1. Set to the ATW position if quick set up is required or the characteristic/color temperature of the light is likely to fluctuate during shooting.
2. Use the AWC position if the characteristic/color temperature of scene is stable.
3. Set to the MANUAL position for manual white and black balance setting.

13 CHECK ON/OFF Switch (ON/OFF)

In the ON position, the setting condition of the camera can be displayed in the viewfinder and the video monitor connected to the Video Output 2/CHECK Connector (33) as CHECK 1 and 2 display when the CHECK 1-2 button is pressed. In the OFF position, the CHECK display is not provided even if the CHECK 1/2 button is pressed; but the composite video signal is provided.

Set this switch to the OFF position if the Video Output 2/CHECK Connector (33) is used as a line output.

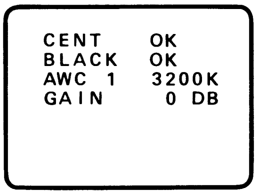
14 CHECK Button (CAMERA CHECK 1-2, RESET)

The setting condition of camera can be repeatedly displayed in the viewfinder and the video monitor, connected to the Video Output 2/CHECK Connector (33), as CHECK 1 and 2 displays by pressing the CHECK 1-2 button when the CHECK ON/OFF Switch (13) is in the ON position.

The CHECK display disappears when the CHECK RESET button is pressed.

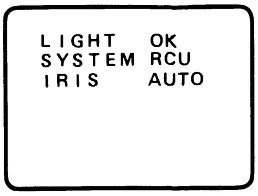
Note : The CHECK display disappears when the automatic white balance, black balance or centering setting are activated.

CHECK 1



```
CENT     OK
BLACK    OK
AWC 1    3200K
GAIN      0 DB
```

CHECK 2



```
LIGHT   OK
SYSTEM  RCU
IRIS    AUTO
```

15 Red Gain Control (R GAIN)

White balance can be set manually by this control and the blue gain control (16) when the White Balance Selection Switch (12) is set to the MANUAL position. Turn this control clockwise (or counterclockwise) to increase (or decrease) the R signal level.

16 Blue Gain Control (B GAIN)

White balance can be set manually by this control and the Red Gain Control (15) when the White Balance Selection Switch (12) is set to the MANUAL position. Turn this control clockwise (or counterclockwise) to increase (or decrease) the B signal level.

17 Total Pedestal Control (TOTAL PEDESTAL)

This control can adjust the pedestal level of the video signal (luminance). Turn this control clockwise (or counterclockwise) to increase (or decrease) the pedestal level.

18 Red Pedestal Control (R PEDESTAL)

Black balance can be set manually by this control and the Blue Pedestal Control (19) when the White Balance Selection Switch (12) is set to the MANUAL position. Turn this control clockwise (or counterclockwise) to increase (or decrease) the R pedestal level.

19 Blue Pedestal Control (B PEDESTAL)

Black balance can be set manually by this control and the Red Pedestal Control (18) when the White Balance Selection Switch (12) is set to the MANUAL position. Turn this control clockwise (or counterclockwise) to increase (or decrease) the B pedestal level.

20 Horizontal Phase Control for Gen-lock (H PHASE)

The horizontal phase of the camera signal is adjusted to match the horizontal phase of the signal at the Gen-lock Input Connector (29).

21 Subcarrier Phase Fine Control for Gen-lock (SC PHASE FINE)

This control allows fine adjustment of the sub carrier phase set by the Subcarrier Phase Coarse Switch (22). It gives continuous control of up to plus 90° subcarrier phase to match the phase of the burst signal at the Gen-lock Input Connector (29).

22 Subcarrier Phase Coarse Switch for Gen-lock (SC PHASE COARSE)

The subcarrier phase of the camera signal is adjusted from 0° to 360° in 90° steps with this switch for matching the phase of the burst signal at the Gen-lock Input Connector (29).

23 Cable Length Compensation Switch (CABLE COMP)

This switch is used for the cable length compensation of the 14-pin studio cable between the camera and RCU as follows;

10m (30ft) : Cable length less than 10m (30ft)
40m (120ft) : Cable length 10 -40m (30 - 120ft)
70m (210ft) : Cable length 40 -70m (120 -210ft)
100m(300ft): Cable length 70 -100m (210 - 300ft)

24 Total Gain Fine Control (FINE, TOTAL GAIN)

This control allows fine adjustment of the video signal level for the cable length compensation. Adjust this control after setting the Cable Length Compensation Switch (23).

25 Chroma Gain Fine Control (FINE, CHROMA GAIN)

This control allows fine adjustment of the chroma signal level for the cable length compensation. Adjust this control after setting the Cable Length Compensation Switch (23).

26 Lens Iris Control (IRIS AUTO-CLOSE/OPEN)

This control selects the operational condition of the auto iris power servo control zoom lens as follows;

AUTO : The iris level of the zoom lens is controlled automatically .
CLOSE/OPEN : The iris level of the zoom lens can be manually controlled by turning this control.
Note : The Iris Selection/Manual Control Knob on the lens should be pushed to the AUTO position.

27 14-Pin Camera Connector (CAMERA)

14-pin studio cable is connected between the camera and RCU in the system operation.

28 Gen-lock Input Termination Switch (75Ω/Hi-Z)

When bridging or looping through the gen-lock signal, set this switch to the Hi-Z position. Otherwise, set it to the 75Ω position.

29 Gen-lock Input Connector (BNC) (GEN-LOCK IN)

These connectors are used to supply the gen-lock signal (black burst or composite signal) from the system reference.

Two connectors are provided for bridging or looping through applications.

30 Auxiliary Input Termination Switch (75Ω/Hi-Z)

When bridging or looping through the auxiliary signal, set this switch in the Hi-Z position. Otherwise, set it to the 75Ω position.

31 Auxiliary Input Connector (BNC) (AUX IN)

These connectors are used to supply the lineview signal from the special effects generator. Two connectors are provided for bridging or looping through applications.

32 Video Output 1 Connector (BNC) (VIDEO OUT 1)

This connector is used to provide the composite video output signal to the special effects generator, the video monitor or VTR.

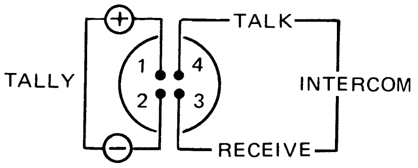
33 Video Output 2/CHECK Connector (BNC) (VIDEO OUT 2/CHECK)

This connector is used to provide the composite video output signal to the special effects generator, the video monitor or VTR.

The CHECK display is superimposed onto the video signal when the CHECK ON/OFF Switch (13) and the CHECK Button (14) are operated.

34 Tally and Intercom Input Connector (TALLY & INTERCOM)

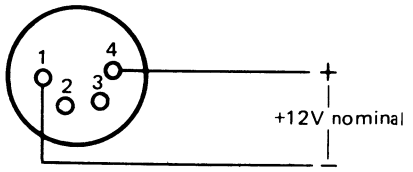
The 4-pin cable is connected between this connector and the tally & intercom output of the special effects generator.



35 4-Pin External DC Input Connector (EXT DC)

This connector is used for connecting a cable from an external DC power source (a car battery for example). Maximum voltage that can be supplied is 22V DC.

Cable Length	DC Power Source
10m (30ft)	13V - 15V, more than 2.5A
40m (120ft)	15V - 18V, more than 2.2A
70m (210ft)	17V - 20V, more than 2A
100m (300ft)	19V - 22V, more than 1.8A



RCU/Gen-lock Adaptor WV-AD33

36 **Power Indicator (Red)**
This indicator lights when the RCU/gen-lock adaptor is in the operating condition.

37 **Lock Screw**
Turn these lock screws clockwise to attach the RCU adaptor to the camera.

38 **Intercom Jack (INTERCOM)**
This intercom jack is used for communication between camera operator and RCU operator in system operation with special effects generator.

39 **Gen-lock Indicator (GEN-LOCK)**
This indicator lights ON when the gen-lock signal (composite or black burst signal) for external synchronization is supplied to the Gen-lock Input Connector (41) or to the 14-Pin RCU Connector (42) via the RCU.

Gen-Lock :
Cameras for occasional use in studio operations must be capable of being synchronized with other cameras or a sync or video reference source. Where the outputs of two or more cameras are combined at a special effects generator for example, each camera in the system must be synchronized.
Synchronization was formerly achieved by driving all cameras from a master sync generator. Today, it is more common for a video signal source such as a camera, to be designated the master for synchronization purposes.
This master unit operates from its own internal sync generator and the cameras are supplied with composite video or black burst from the master.
The internal synchronizing circuit in each camera locks their sync and subcarrier to that of the master. This system, called gen-lock, modifies the camera's sync generator operation to keep it in lock.

40 **Intercom Level Control (INTERCOM LEVEL)**
Turn this control to obtain optimum sound level for the headset connecting to the Intercom Jack (38).

41 **Gen-lock Input Connector (GEN-LOCK)**
The color video signal of camera is automatically synchronized to the gen-lock signal (composite or black burst) which is introduced in this connector from the system reference such as a special effects generator.
Caution : If the gen-lock signal contains much jitter (such as a VTR playback signal), the camera may not be synchronized properly.

42 **14-Pin RCU Connector (RCU)**
This connector is used for connecting the 14-pin studio cable from the remote control unit (RCU) for system operation.

43 **Horizontal Phase Control (H PHASE)**
The horizontal phase of the camera signal is adjusted to match the horizontal phase of the signal at the Gen-lock Input Connector (41).
This control should be adjusted when the camera is used in a system using a special effects generator.

44 **Subcarrier Phase Fine Control (FINE)**
This control allows fine adjustment of the subcarrier phase set by the Subcarrier Phase Coarse Switch (45).
It allows continuous control of up to plus 90° subcarrier phase to match the phase of subcarrier signal at the Gen-lock Input Connector (41).
This control should be adjusted together with the Subcarrier Phase Coarse Switch (45) when the camera is used in the system using the special effects generator.

45 **Subcarrier Phase Coarse Switch (SC PHASE)**
The subcarrier phase of the camera signal is adjusted from 0° to 360° in 90° steps with these switches as shown below for matching the phase of subcarrier signal at the Gen-lock Input Connector (41).
The switches should be set when the camera is used in the system using the special effects generator.

SC Phase	0°	90°	180°	270°
Position of Switches	□ 4 ■ 3 □ 2 ■ 1	□ 4 ■ 3 ■ 2 □ 1	■ 4 □ 3 □ 2 ■ 1	■ 4 □ 3 ■ 2 □ 1

46 **32-Pin Junction Connector**
This connector is used to connect the RCU/gen-lock adaptor to the camera.

AC Adaptor/Charger WV-PS31

50 Release Button

When dismounting the WV-PS31 from the camera, press this button.

51 Charging Connector

When charging the battery pack WV-PS60 or WV-PS33, connect a battery cord of battery pack to this connector. When the battery cord is connected, WV-PS31 is converted to the charger.

52 Charge Indicator

This indicator lights red in the quick charging mode and green in the slow charging mode.

The quick charging is completed after approximately 1.5 hour for battery pack WV-PS60 and 3 hours for WV-PS33. The WV-PS31 is converted to the slow charging mode after completing the quick charging.

Note : It is recommended to charge the battery pack for approximately 14 hours (not more than 24 hours) in the slow charging.

53 Power Indicator

This indicator lights up whenever the unit is operated.

54 Power Switch

This switch activates power for the unit.

55 4-pin Connector for AC Adaptor

Connect this connector to 4-pin external DC input connector on the camera for the AC adaptor.

5" Viewfinder WV-VF65

60 Tally Lamp

This tally lamp is operated only when this unit is used in full system operation with optional RCU and special effects generator. The tally lamp indicates the camera operator and other people that this camera system is actually shooting the scene.

61 Contrast Control (CONTRAST)

Turn this control clockwise to increase picture contrast only in the viewfinder.

62 Brightness Control (BRIGHT)

Turn this control clockwise to increase picture brightness only in the viewfinder.

63 Tally ON/OFF Switch (TALLY ON/OFF)

This switch turns ON/OFF the tally lamp 60 located on front of the viewfinder.

64 Peaking ON/OFF Switch (PEAKING ON/OFF)

This switch is set to the OFF position in the normal operating condition. When the camera is aimed at a weakly illuminated scene, set the switch to the ON position so that focusing of picture in the viewfinder is easily made.

65 Viewfinder Adjusting Knob

The angle of optional 5" viewfinder can be adjusted for easy viewing.

66 Tally Indicator

This tally indicator indicates the camera operator that this camera system is actually shooting the scene and sent to the line output when this unit is used in full system operation with the RCU and special effects generator.

CIRCUIT DESCRIPTION

1. Remote Control Unit (RCU) WV-RC33

The remote control unit consists of the following circuits.

- 1-1 +12V DC regulator circuit
- 1-2 Gen-lock signal circuit
- 1-3 VIDEO output circuit
- 1-4 Sync separator circuit
- 1-5 Control data parallel/serial converter
- 1-6 Switch data parallel/serial converter
- 1-7 AUX amplifier circuit
- 1-8 Intercom amplifier circuit
- 1-9 +17V DC regulator circuit

1-1. +12V DC Regulator Circuit

This circuit is a regulator of the switching regulator type and generates +12V from the +17V supplied from the power board to this board.

IC4 is an IC for the switching regulator and incorporates oscillator/reference voltage generator and protector. Oscillation frequency, set at approximately 120kHz, can be adjusted with VR6 at pin 12 of IC4. From pin 7, 120kHz pulse generated within IC4 is output and applied to the base of Q17. The pulse at the collector of Q17 is rectified by L2/C27 and converted into DC voltage. Pin 5 performs detection of output voltage, and controls the duty of pulse from pin 7 corresponding to the output voltage so that the output voltage may be kept at a constant level.

IC3(a) generates +8.6V DC and IC3(b) and Q20 generates +4.8V DC.

1-2. Gen-lock Signal Circuit

This circuit receives the black burst signal supplied to the GEN-LOCK input connector, and sends the black burst signal to the RCU/Gen-lock adaptor after phase shifting the burst.

The black burst signal supplied to the GEN-LOCK input connector is sync separated by Q1 and Q2 and fed to monostable multivibrator IC2. From pin 7 of IC2, a burst gate pulse with a pulse width of approximately 5 μsec is generated and supplied to the base of burst gate Q6.

The black burst signal fed to the GEN-LOCK input connector is also supplied to the base of Q3. The signal is supplied to the collector of burst gate Q6 via the amplifier composed of Q3, Q4 and Q5 and its burst portion is extracted there. The extracted burst signal is supplied to the burst phase splitter composed of Q1 and Q2 on the SC board. SW1 is an SC PHASE COARSE switch and generates a subcarrier signal with a 90 degree phase shift at Q3 and Q4 on the basis of the burst signal with a 180 degree phase difference generated by Q1 and Q2.

Q5 and Q6 are a 90 degree phase shifter and can fine-adjust the phase of the subcarrier output with VR2 (SC PHASE FINE).

The subcarrier (burst) signal thus obtained is mixed with the sync signal output from sync separator Q1 and Q2 by the mixer inserted into the base of Q13. The levels of the sync signal and burst signal to be mixed can be adjusted with VR4 (SYNC LEVEL) and VR5 (BLACK BURST LEVEL). The black burst signal obtained in the foregoing process is amplified by Q13, Q14 and Q15 and output to the RCU/Gen-lock adaptor as a gen-lock signal.

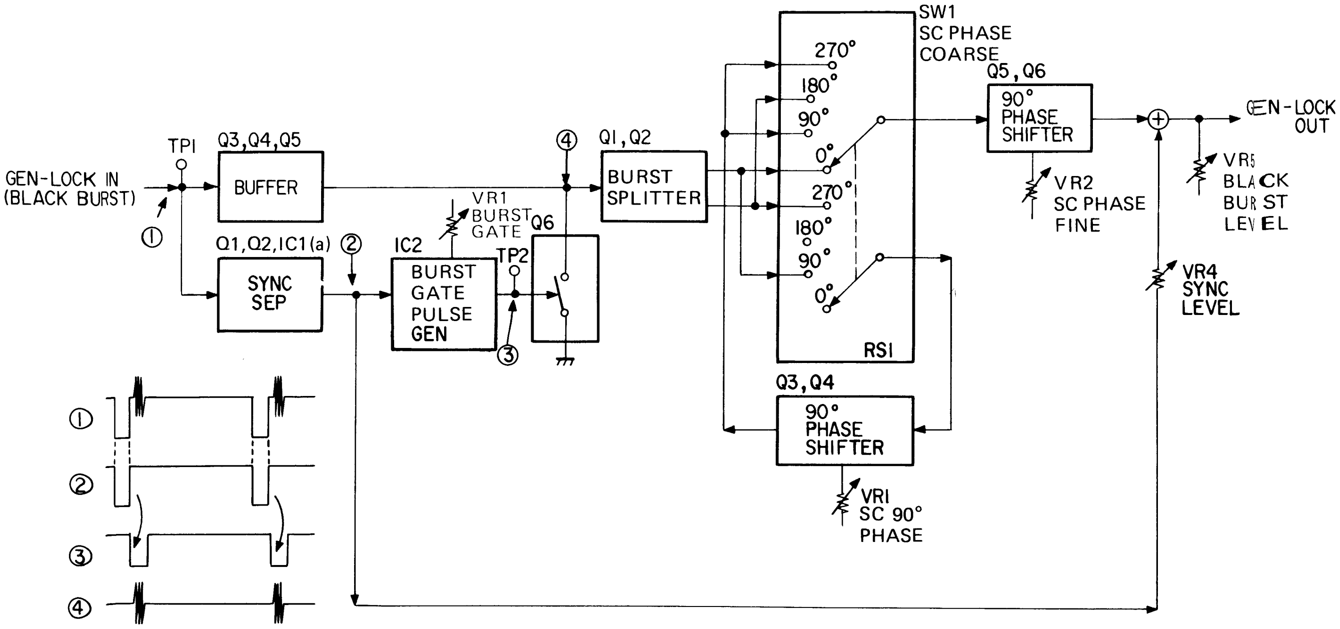

SW1
SC PHASE
COARSE
270°
180°
90°
0°
270°
180°
90°
0°
RS1
Q5,Q6
90° PHASE SHIFTER
GEN-LOCK OUT
VR5
BLACK BURST LEVEL
VR2
SC PHASE FINE
VR4
SYNC LEVEL
Q3,Q4
90° PHASE SHIFTER
VR1
SC 90° PHASE
TP1
Q3,Q4,Q5
BUFFER
GEN-LOCK IN
(BLACK BURST)
①
Q1,Q2,IC1(a)
②
SYNC SEP
IC2
BURST GATE PULSE GEN
VR1
BURST GATE
Q6
TP2
③
④
Q1,Q2
BURST SPLITTER
①
②
③
④

Fig. 1-2 Gen-lock Signal Circuit

1-3. VIDEO Output Circuit

This circuit corrects frequency characteristic deteriorated by cable connection of an adaptor or remote control unit with the video output of the camera according to the length of the cable.

To the base of Q27, the VIDEO signal is fed from the RCU connector. This input signal is corrected in frequency response by the buffer amplifier composed of Q27 - Q31 and supplied to video amplifier Q34 and Q35 of the next step. The output of the video amplifier composed of Q34 and Q35 is corrected in frequency response by VR9 (CHROMA GAIN) adjusted in signal gain by VR10 (TOTAL GAIN) and supplied to buffer amplifier Q42, Q43 and Q44. The output of Q42, Q43 and Q44 is corrected in frequency response by Q36, Q37 and Q38 via Q39, Q40 and Q41 and fed back to the base of video amplifier Q35. IC1(b) and (c) form an astable multivibrator. The oscillated signal is sent to amplifier Q16 and rectified by D4 and C19 to generate -5V DC.

The VIDEO signal fed in the foregoing process is corrected in frequency response. Q36, Q37 and Q38 are selected according to the setting of the CABLE LENGTH COMPENSATION switch SW2, and thereby permitting the switching of levels and frequency response to be corrected. For example, if the CABLE LENGTH COMPENSATION switch SW2 is set at 40m, the base of Q38 goes low because the common terminal of SW2 is grounded. This turns Q38 and Q40 ON, which forms a feedback loop, causing the collector C/R of Q38 to be connected with the feedback loop, and thereby correcting the frequency response deteriorated by the the cable length. Signals generated by this circuit are output as VIDEO-1 signals. Besides, a portion of the VIDEO signals is sent to the base of the character mixer Q56 - Q59 and mixed with CHECK display character signal comes through amplifier Q68 and IC12 to Q59. The mixed signal is then sent out as VIDEO-2 signals via amplifier Q60 - Q62.

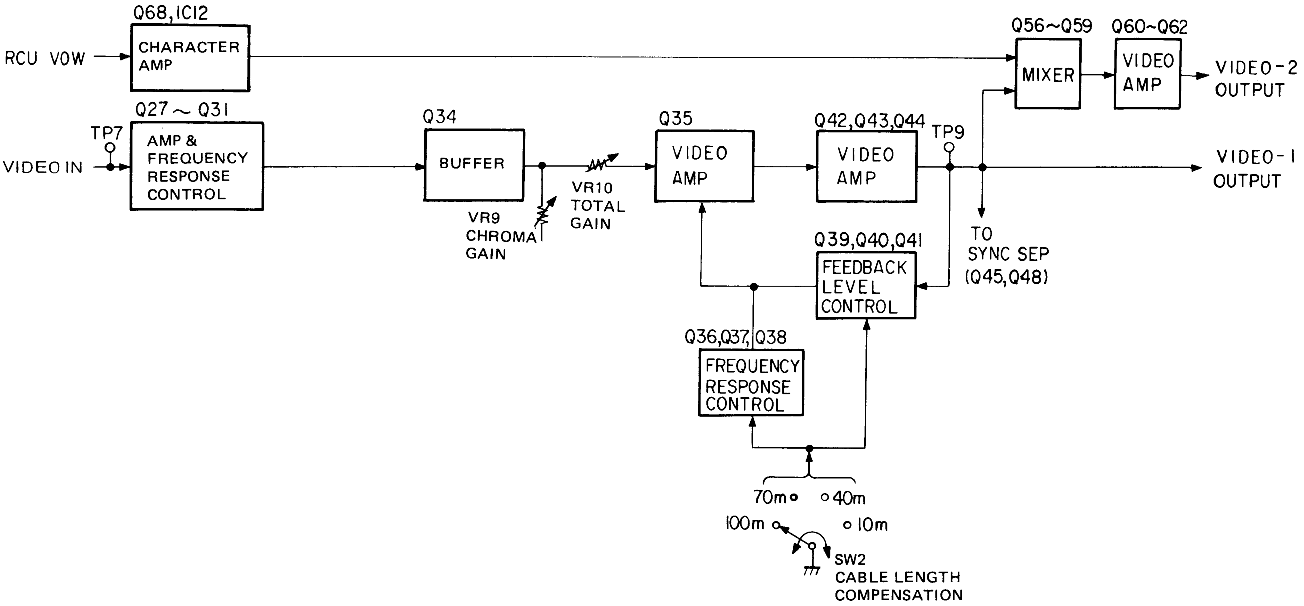

Q68,IC12
RCU VOW
CHARACTER AMP
Q56~Q59
Q60~Q62
MIXER
VIDEO AMP
VIDEO-2 OUTPUT
Q27~Q31
TP7
VIDEO IN
AMP & FREQUENCY RESPONSE CONTROL
Q34
BUFFER
VR10 TOTAL GAIN
VR9 CHROMA GAIN
Q35
VIDEO AMP
Q42,Q43,Q44
VIDEO AMP
TP9
VIDEO-I OUTPUT
TO SYNC SEP (Q45,Q48)
Q39,Q40,Q41
FEEDBACK LEVEL CONTROL
Q36,Q37,Q38
FREQUENCY RESPONSE CONTROL
70m
40m
100m
10m
SW2
CABLE LENGTH COMPENSATION

Fig. 1-3 Video Signal Circuit

1-4. Sync Separator Circuit

This circuit separates sync from the VIDEO signal input from the VIDEO output circuit.

The sync separator is composed of Q45 and Q48. VIDEO signals from the VIDEO output circuit are fed to the base of Q45, and the separated sync signals from collector of Q48 are further supplied to IC8 and are used as H rate clock signals. The separated sync signals are also sent to an integrator composed of R157, R158, C70 and C71 which eliminates the H sync components of the input sync signal and detects only the V sync. The V sync signal is then fed to V sync shaper Q49, Q50 and Q51 and the V pulses obtained are used for serial/parallel control of switch data serial/parallel converter IC9 and IC10 and as V reset pulses for H counter IC8.

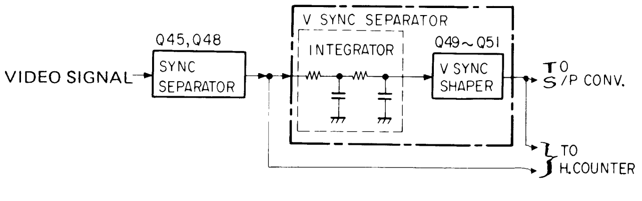
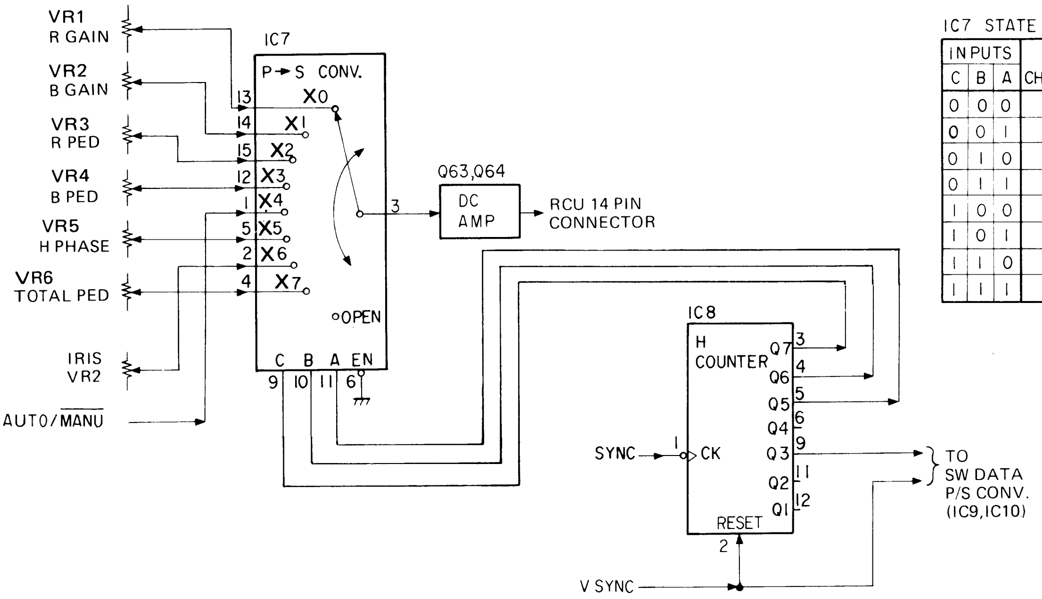

V SYNC SEPARATOR
Q45,Q48
INTEGRATOR
Q49~Q51
VIDEO SIGNAL
SYNC SEPARATOR
V SYNC SHAPER
TO S/P CONV.
TO H.COUNTER

Fig. 1-4 Sync Separator Circuit

1-5. Control Data Parallel/Serial Converter

This circuit time-divides R GAIN, B GAIN, R PED, B PED, H PHASE, TOTAL PED and IRIS control data and the respective switch setting position (AUTO/MANUAL) from parallel to serial with the timing of H sync created by separating sync from the VIDEO signal, and sends the data as RCU DC CONT signals to the 14-pin connector. Counter IC8 functions as a channel select controller and counts the H sync output from the collector of sync separator Q48. Pins 5, 4 and 3 of IC8 provide 3-bit data for channel selection of analog multiplexer IC7. At IC7, channels are sequentially switched from X0 to X7 at 16H intervals according to the logic of the 3-bit data, and parallel DC data is converted to serial DC data and supplied from pin 3 of IC7 to the base of Q63. Q63 and Q64 are a buffer amplifier and outputs RCU DC CONT signals to the 14-pin connector.



IC7 STATE TABLE

INPUTS			ON CHANNEL	DC SIGNAL
C	B	A		
0	0	0	0	R GAIN
0	0	1	1	B GAIN
0	1	0	2	R PED
0	1	1	3	B PED
1	0	0	4	AUTO/MANU
1	0	1	5	H PHASE
1	1	0	6	IRIS
1	1	1	7	TOTAL PED

Fig. 1-5 Control Data Parallel/Serial Converter Circuit

1-6. Switch Data Parallel Serial Converter

This circuits converts from parallel to serial at 4H intervals the data indicating the setting positions of each switch which is mounted on the remote control unit, and is sent to 14-pin connector as RCU S DATA. IC9 and IC10, a shift register, latch each switch setting data given in 8-bit parallel for each 8H-interval clock signal output from pin 9 of IC8, and sends out the data with an 8-clock timing shift. The switch data converted to serial is fed as RCU S DATA to the 14-pin connector via Q65 and Q66.

1-7. AUX Amplifier Circuit

This circuit sends out signal input to AUX INPUT connector after going through a buffer amplifier.

Signals fed to the AUX INPUT connector are supplied to the emitter of Q23 after their level is adjusted by VR8 (AUX LEVEL). Q23 to Q26 are a buffer amplifier and send AUX signals to the 14-pin connector.

1-8. Intercom Amplifier Circuit

The audio signal from the 4-pin tally/intercom connector is amplified by IC5 and sent to intercom jack on the RCU through buffer Q21 and to the camera through 14-pin connector.

The audio signal fed from the intercom jack on the RCU through buffer Q22, the camera through 14-pin connector and 4-pin tally/intercom connector are amplified by IC11 and sent via 4-pin connector to other system. Q67 is tally indicator drive.

1-9. +17V DC Regulator Circuit

This circuit is located on the Power board and generates the regulated +17V by use of switching regulator. Approximately 20V AC obtained at the secondary winding of power transformer T1 is rectified by D1 and +30V DC is obtained. Approximately 120kHz triangle waveform is oscillated and compared with the DC voltage made by comparison between the reference voltage and output voltage detected. The pulse which is generated by the comparator and whose duty is controlled by the DC voltage from the error amplifier is sent via buffer Q2/Q3 to switching output Q1. The output pulse at the collector of Q1 is filtered by L2, FS1 and C9 and +17V is generated. The output voltage is detected at 14-pin connector on the RCU/gen-lock adaptor WV-AD33 and sent back to error amplifier through pin 2 of E1 and pin 1 of IC1 and controls the duty of pulse generated by the comparator in order to maintain the +17V constant at WV-AD33. Q4 and D3 generate +10V DC for switching regulator.

2. RCU/Gen-lock Adaptor WV-AD33

The WV-AD33 is mounted with two boards consisting of following circuits.

- 2-1 Int 17MHz/Interleaving Oscillator Circuit
- 2-2 Sync Generator Circuit
- 2-3 SC Phase Shifter Circuit
- 2-4 Sync Separation Circuit
- 2-5 Ext 17MHz Oscillator Circuit
- 2-6 Gen-Lock 14MHz Oscillator Circuit
- 2-7 Phase Control Circuit
- 2-8 +12V Regulator Circuit
- 2-9 RCU DC Control Voltage Demultiplexer Circuit

2-1 Int 17MHz/Interleaving Oscillator Circuit

This circuit oscillates the 17MHz/Interleaving (14MHz) frequency in the internal sync mode and sends it to the sync generator IC. In the gen-lock/external sync mode, this circuit stops oscillating the 17MHz/14MHz frequency.

When no signal is supplied to pin 37 of sync generator IC3, internal 17MHz oscillator consisting of crystal oscillator X3, CT4 (4.43MHz ADJ), C29 and C30 oscillates 17MHz frequency. The oscillated 17MHz signal is sent to IC3, it is compared in phase with the signal oscillated by voltage controlled crystal oscillator (VCXO) consisting of X1, CT1 (INTERLEAVING), C14 and C15, and the phase difference is converted into the DC voltage.

The DC voltage corresponding to the phase difference is obtained at pin 46 of IC3 and sent to the VCXO to controlled the oscillating frequency by changing the capacitance of variable capacitance diode D2. The frequency-controlled signal is then fed to IC3 through pin 41 and it is compared with the 17MHz signal in phase. In this way, the phase lock loop (PLL) is made and pulses locked with the subcarrier signal are generated from IC3 respectively. When the PLL is stabilized, the VCXO oscillates approximately 14MHz. CT4 is a control for setting the subcarrier frequency by controlling the internally oscillated 17MHz frequency. CT1 is for setting lock range of VCXO.

2-2 Sync Generator Circuit

This circuit receives the 17MHz signal in internal sync mode or external sync mode, and generates all sync signals which are used in the camera.

The 4.43MHz subcarrier signal (SC1) is obtained at pin 24 of sync generator IC3 and it is sent to the camera head through phase control circuit consisting of Q13 and Q15, pin 4 of CN3 and connector board.

The 4.43MHz delayed 90 degree from SC1 subcarrier signal (SC2) is obtained at pin 21 of sync generator IC3 and it is sent to the camera head through phase control circuit consisting of Q12 and Q14, pin 2 of CN3 and connector board.

The composite sync pulse (A) at pin 14 of sync generator IC3 is sent to the inverter IC2(c) and it is sent to the camera head through pin 6 of CN2 and connector board.

The burst flag pulse (BFP) (B) at pin 13 of sync generator IC3 is sent out to the camera head through buffer IC5(e), pin 3 of CN3 and connector board.

The composite blanking (BL) pulse (C) at pin 7 of sync generator IC3 is sent out to the base of sync gate Q2. This BL is also supplied to the camera head through buffer IC5(a), pin 5 of CN2 and connector board.

The vertical scanning (Vs) pulse at pin 18 of sync generator IC3 is sent out through buffer IC5(c) to camera head and RCU control board through pin 7 of CN2 and pin 2 of CN1 respectively.

The wide horizontal driving (W.HD) pulse (D) at pin 15 of sync generator IC3 is sent out to the camera head through buffer IC5(d), pin 4 of CN2 and connector board.

The horizontal scanning (Hs) pulse (F) at pin 11 of sync generator IC3 is sent out to the RCU control board through buffer IC5(b).

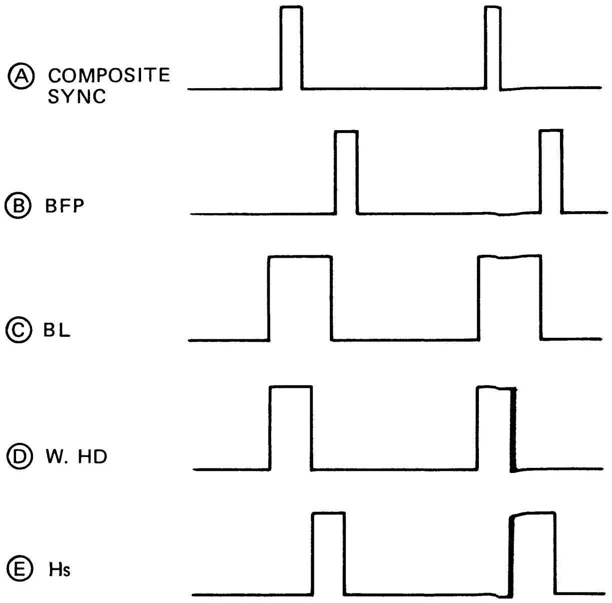


Fig. 2-2 Sync Pulses

2-3 SC Phase Shifter Circuit

In the system using multiple cameras, the burst signal on each camera video signal should be adjusted to same phase. This circuit shifts the phase of subcarrier (SC) signal generated in the sync generator IC to adjust the phase of burst signal.

SW1 (SC PHASE COARSE SWITCH-1) and SW2 (SC PHASE COARSE SWITCH-2) connected to respective pins 32 and 33 of sync generator IC3 shifts the phase of subcarrier signal from 0° to 360 in 90° step.

The SC signal (A) obtained at pin 22 of sync generator IC3 is sent to pin 10 of monostable multivibrator IC4(b).

The output (B) of IC4(b) at pin 12 is fed to pin 2 of another monostable multivibrator IC4(a). The output (C) of IC4(a) at pin 13 is fed back to pin 25 of IC3. VR2 (SC PHASE FINE) is a control to shift the subcarrier phase more than 90° by changing the power voltage for IC4(b). By adjusting SW1, SW2 and VR2, the phase of subcarrier generated from IC3 can be shifted more than 360°.

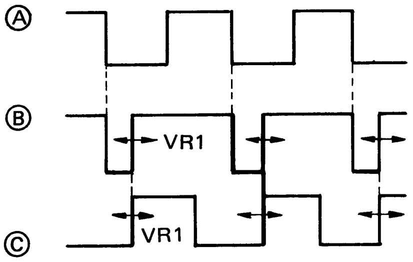


Fig. 2-3 SC Phase Shifter

2-4 Sync Separation Circuit

This circuit receives the black burst signal or color signal supplied to the gen-lock input connector on the rear of camera or the gen-lock input connector on the remote control unit (RCU), and separates the sync and burst signal from the gen-lock signal. The separated sync and burst signal is fed to the sync generator circuit for the gen-lock/external sync mode.

The gen-lock signal (the black burst or color signal) A is sent through pin 6 of CN1 to base of Q1.

The base of sync separation Q9 receives gen-lock signal through buffer Q8 from pin 6 of CN1. The separated sync signal obtained at collector of Q9 is sent through amplifier Q10 and NOR gate (inverter) IC1(c) to pin 37 of IC3 in the sync generator circuit.

When it is fed to pin 37 of IC3, the sync generator IC3 is converted into the gen-lock/external sync mode and pulses which are synchronized with the separated sync signal are generated.

If the sync signal is not applied to pin 37 of IC3, the sync generator IC3 remains in the internal sync mode. The separated sync signal (B) obtained at the pin 10 of IC1(c) is also sent to breeze way pulse generator consisting of IC1 (d), C12, R27, D1, Q11 and IC1(b).

The negative sync signal (C) obtained at pin 13 of NOR gate (inverter) IC1(d) is sent through control-current-differential circuit consisting of C12 and R27, and D1 to base of switching Q11 and is changed to pulse (E). The negative breeze way gate pulse (E) obtained at collector of switching Q6 is sent through NOR gate (inverter) IC1(b) to pin 3 of IC1(a) (F).

The gen-lock signal (A) is also sent to burst gate consisting of Q1 and Q2. The positive blanking (BL) signal (G) is sent to base of Q2 from sync generator IC3. The Q2 turns OFF during positive portion of BL signal and Q2 turns ON during negative portion of BL signal. As a result, sync and burst signal are detected. The detected signal (H) is fed to 4.43MHz band pass filter consisting of L2, C4 and R6 to remove the low frequency component and detect only burst signal (I). The detected burst signal is sent through amplifier consisting of Q3 to Q7 to pin 2 of NOR gate IC1(a). The NOR gate IC1(a) removes noise during the breeze way portion and detected burst signal obtained at pin 1 of IC1(a) is supplied to pin 35 of sync generator IC3. And the sync generator generates the subcarrier (SC) signal which is synchronized with the detected burst signal.

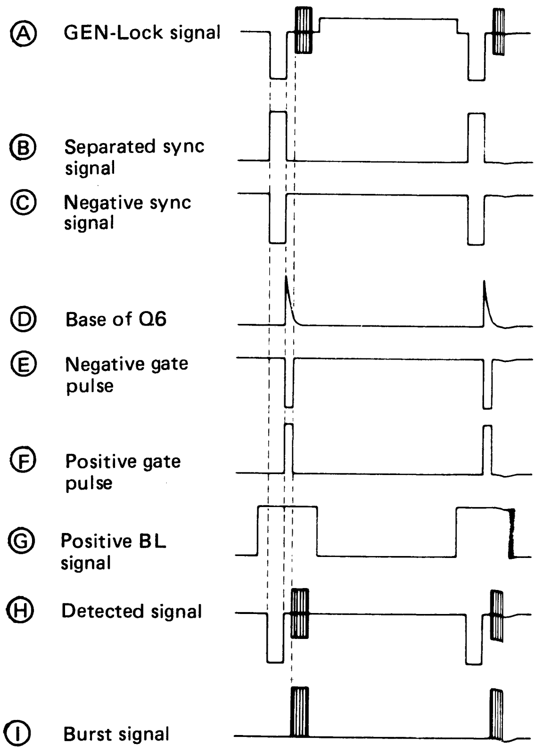


Fig. 2-4 Burst Signal

2-5 Ext 17MHz Oscillator Circuit

In the gen-lock/external sync mode, this circuit oscillates the 17MHz to make the subcarrier (SC) signal whose frequency/phase is same as the burst signal of gen-lock signal.

In the gen-lock/external sync mode, the SC signal generated in sync generator IC3 and the burst signal separated from the gen-lock signal and sent to pin 35 of IC3 are compared in phase in IC3. The phase difference in comparison is converted into the DC voltage and obtained at pin 36 of IC3 and it is sent to 17MHz voltage controlled crystal oscillator (VCXO) consisting of crystal oscillator X2, D4, C28 and CT3 (SC LOCK) to control the oscillating frequency by changing the capacitance of variable capacitance diode D4.

The 17MHz frequency is fed back to pins 28 and 29 of IC3 to generate the SC signal. In this way, the phase lock loop (PLL) circuit is made and the frequency of VCXO is controlled in order to generate the SC signal whose frequency and relative phase matches that of gen-lock burst signal.

CT3 (SC LOCK) is a control for adjusting the lock range of the PLL circuit.

2-6 Gen-Lock 14MHz Oscillator Circuit

When the sync signal separated from the gen-lock signal is sent to the sync generator IC3, the H sync signal is compared with the horizontal drive (HD) pulse in phase in the sync generator IC3 and converted into the DC voltage which controls this circuit to oscillate the 14MHz frequency. It is sent to the sync generator IC3 to generate the HD pulse. In this way, the phase lock loop (PLL) circuit is made in the gen-lock/external sync mode and the 14MHz frequency is controlled to generate the HD pulse whose phase coincides with that of gen-lock sync signal. The sync generator IC3 is reset vertically in the IC3 by the sync signal supplied to the IC3.

When the sync signal separated from the gen-lock signal in the sync separation circuit is sent to pin 37 of sync generator IC3, the HD pulse generated in IC3 and horizontal (H) sync signal separated from the sync signal are compared in phase in IC3. The phase difference is converted into the DC voltage and obtained at pin 45 of IC3. It is fed to the 14MHz voltage controlled oscillator (VCO) consisting of D3, C18 to C20, C21, L4, IC2(a) and CT2 (SYNC LOCK) and controls the oscillating frequency by changing the capacitance of variable capacitance diode D3. The pin 2 of IC2(a) receives gen-lock detect control from pin 38 of sync generator IC3. In the gen-lock/external sync mode, this potential is low level, and the VCO starts oscillating 14MHz. The 14MHz frequency is fed back to pins 42 of IC3 through buffer IC2(b) to generate the HD pulse. In this way, the phase lock loop (PLL) circuit is made and the frequency of 14MHz VCO is controlled in order to generate the HD pulse whose relative phase matches that of H sync signal of gen-lock sync signal. CT2 (SYNC LOCK) is a control for setting the lock range of the PLL circuit.

The relative phase between the HD pulse and the H gen-lock sync is adjusted by the DC voltage supplied to pin 1 of IC3. It is used to eliminate a horizontal phase difference between incoming gen-lock signal and internal oscillator. VR3 (H.PHASE COARSE-1) changes the DC voltage supplied to pin 1 of IC7. VR4 (H.PHASE COARSE-2) set the adjusting range of VR3.

2-7 Phase Control Circuit

This circuit receivers the subcarrier-1 (SC1) signal and subcarrier-2 (SC2) signal from the sync generator circuit where the phase of subcarrier signal is compensated and sends out to the other circuit.

The SC2 signal is fed from the sync generator circuit to band pass filter (BPF) consisting of R79, C37 and L6 whose center frequency is 4.43MHz. After hermonics of 4.43MHz is removed by BPF, the SC2 signal is fed to phase compensator consisting of Q12, C36 and R56 where the phase drift between camera head and gen-lock adaptor is compensated. The phase compensated SC2 signal is fed through buffer Q14 and Pin 2 of CN3 to camera head.

The SC1 signal is fed from the sync generator circuit to band pass filter (BPF) consisting to R81, C38 and L7 whose center frequency is 4.43MHz. After hermonics of 4.43MHz is removed by BPF, the SC1 signal is fed to phase compensator consisting of Q13 CT5 (G/L SC PHASE), C45 and R63 where the phase drift between camera head and gen-lock adaptor is compensated. The phase compensated SC1 signal is fed through buffer Q15 and pin 4 of CN3 to camera head.

CT5 (G/L SC PHASE) is a control for adjusting the phase of SC1 signal forwarded 90 degree from SC2.

2-8 +12V Regulator Circuit

This circuit generates +12V DC from the +17V DC voltage sent via the RCU connector.

The +12V regulator consists of IC1, Q1, Q2 and D1, with its DC output supplied to +8.6V detector Q3 and Q4 and the GEN-LOCK board. The +5.6V reference voltage generated by zener diode D1 is applied to pin 3 (non-inverting input) of IC1 and the resistance division of the output voltage from this circuit is applied to pin 2 (inverting input) of IC1. From pin 1 of IC1, a fluctuation error of the output voltage against the reference voltage is obtained. Controlling the base of Q1 by the fluctuation error ensures stable generation of +12V DC. Q3 and Q4 detect +8.6V comes from the camera and fed to +12V to the WV-AD33.

2-9 RCU DC Control Voltage Demultiplexer Circuit

RCU (Remote Control Unit) converts the voltages corresponding to the control settings of R GAIN, B GAIN, R PED, B PED, IRIS, H PHASE and TOTAL PED into serial signals by time division and sends them as RCU DC CONT signals. This circuit converts the RCU DC CONT signals into parallel signals with the timing of HD (H sync) and FIELD (V rate pulse) output from the sync generator IC3 of the GEN-LOCK board.

RCU DC CONT signals from the remote control unit (RCU) are biased by Q10 and Q24 and supplied to pin 3 of analog demultiplexer IC2. The RCU DC CONT signals are scanned at 16H (16 line) intervals by the 3-bit timing pulses supplied to pins 9/10/11 (A2/A1/A0 inputs) of IC2, and distributed to DC level holder IC3 and IC4 of each channel. The non-inverting input of the DC level holder of each channel is mounted with a capacitor to hold the DC voltage, and therefore, holds the DC voltage even after channel selector IC2 is switched over to another channel. IC7 generates timing pulses

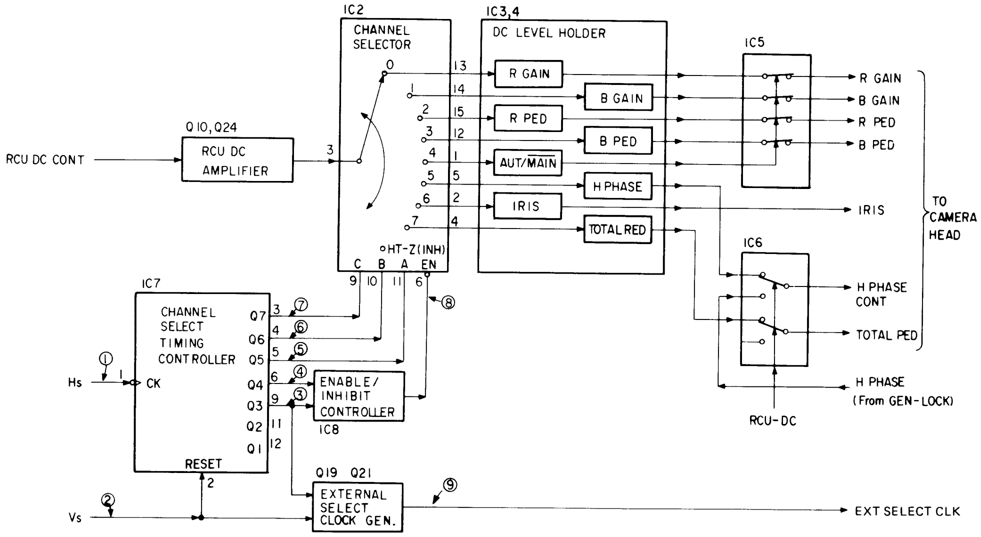

IC2
CHANNEL SELECTOR
IC3,4
DC LEVEL HOLDER
IC5
Q10,Q24
RCU DC AMPLIFIER
RCU DC CONT
R GAIN
B GAIN
R PED
B PED
AUT/MAIN
H PHASE
IRIS
TOTAL RED
oHT-Z(INH)
C B A EN
IC6
TO CAMERA HEAD
H PHASE CONT
TOTAL PED
H PHASE (From GEN-LOCK)
RCU-DC
IC7
CHANNEL SELECT TIMING CONTROLLER
Q7 Q6 Q5 Q4 Q3 Q2 Q1
CK
RESET
Hs
Vs
ENABLE/INHIBIT CONTROLLER
IC8
Q19 Q21
EXTERNAL SELECT CLOCK GEN.
EXT SELECT CLK

Fig. 2-12-1 RCU DC Control Voltage Demultiplexer Circuit

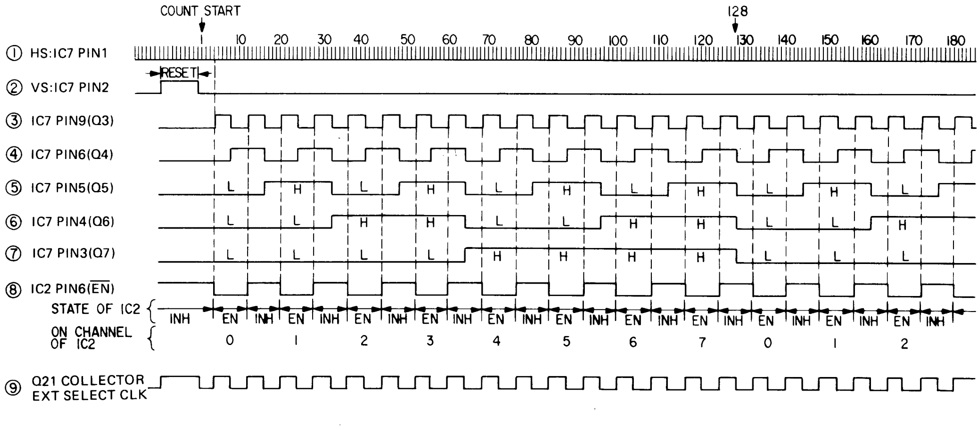

COUNT START
128
① HS:IC7 PIN1
② VS:IC7 PIN2
RESET
③ IC7 PIN9(Q3)
④ IC7 PIN6(Q4)
⑤ IC7 PIN5(Q5)
⑥ IC7 PIN4(Q6)
⑦ IC7 PIN3(Q7)
⑧ IC2 PIN6(EN)
STATE OF IC2
INH
EN
ON CHANNEL OF IC2
0 1 2 3 4 5 6 7 0 1 2
⑨ Q21 COLLECTOR EXT SELECT CLK

Fig. 2-12-2 Channel Select Signals

when performing channel selection. As clock pulses and reset pulses, this circuit uses Hs and Vs signals generated from the timing of HD and FIELD pulses generated by IC16 (sync generator) of the GEN-LOCK board. IC8 is a gate to control the setting of channel selector IC2 for the enable state or inhibit state. As shown in the timing chart, pulses that alternately go high and low at 8H intervals are supplied to pin 6 (EN) terminal of channel selector IC2.

Therefore, when the EN terminal of IC2 goes low it becomes into select enable state, and into select inhibit state when high. Accordingly, channel DC level data corresponding to the select data given to the A0/A1/A2 input while the channel selector is in the select enable state is selected and sent to DC level holder IC3 and IC4. Analog switch IC5 controlled by signal output from IC4(b) closes when the white balance selection switch on the RCU is set to the MANUAL position. Another analog switch IC6 is switched to the upper position when the RCU is connected and the lower position when the RCU is not used.

Q13, Q14, Q22 and Q23 are buffer for CHECK character sent to the RCU and displayed together with the VIDEO signal.

Q11 is buffer for intercom.

3. AC Adaptor/Charger WV-PS31

The AC Adaptor/Charger consists of the following circuits.

3-1 Power Supply Circuit
3-2 Charger Circuit

3-1 Power Supply Circuit

3-1-1 Power Supply for WV-PS31N

The power supply circuit, composed as shown in the block diagram below, rectifies AC power line input and generates +12V DC. +12V DC is generated by the switching regulator method, and the output of +12V DC is supplied to the charger circuit or the camera head. Transistors Q2 and Q3 are a pulse width modulation (PWM) type oscillator which generates switching pulses with widths corresponding to the fluctuations of AC line input.

The switching pulses generated by Q2 and Q3 are supplied to the base of Q4 as trigger, and thereby switching the primary winding of the transformer. Output from the secondary winding of the transformer is supplied to the rectifier composed of D9 (CR9), C15, C16, L4 and C17 to generate +12V DC. This +12V DC is sent to the battery charger circuit via filters L5 and C18. IC1, Q1, Q5 and Q6 represent an over voltage protector which checks whether the rectified output voltage is normal. When the output voltage rises, the LED within the photocoupler IC1 lights up and thereby turns ON the photo-transistor within IC1 which results in the halting of the oscillator and muting of the DC output.

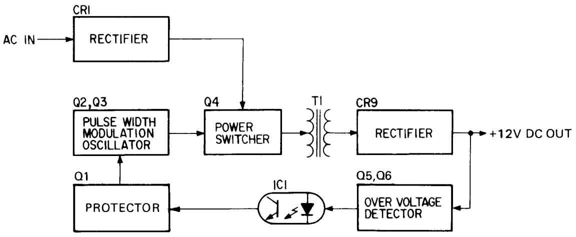


Fig. 3-1 Power Supply Circuit

3-1-2 Power Supply for WV-PS31/B.C.G.NA

The power supply circuit rectifies AC power line input and generates +12V DC. +12V DC is generated by the switching regulator method, and the output of +12V DC is supplied to the charger circuit or the camera head.

The pulse width modulation (PWM) type oscillator inside IC1 which generates switching pulses with widths corresponding to the fluctuations of AC line input. The switching pulses generated by inside IC1 is supplied to gate of Q1 through pin 7 of IC1 as a trigger, and thereby switching the primary winding of the transformer. Output from the secondary winding of the transformer is supplied to the rectifier composed of D51 (CR51), C51, L51 and C52 to generate +12V DC. This +12V DC is sent to the battery charger circuit via filters L52 and C53.

The control voltage from control board to pin 2 of IC51 (a) is compared with +4.3V reference voltage and the difference voltage obtained at pin1 of IC51 (a) is supplied to next comparator pin5 of IC51 (b). +12V DC output divided by R55 (+13V ADJ), R54 and R56 is supplied to pin 6 of IC51 (b). The output at pin7 of IC51(b) performs detection of output voltage and controls the duty of pulse inside IC1 through pin 3 of IC1 corresponding to the output voltage so that the output voltage is kept constant.

When +12V output becomes excessively high, D52 (CR52) connected at pin 1 of IC1 is turned ON and over voltage protector inside IC1 is activated to stop the oscillation of switching pulses and no voltage oftained at secondary winding.

In addition, large current fed to primary winding of T1 due to short circuit, R7 detects the current, as a result, over carrent protector circuit inside IC1 is activatied through pin 5 of IC1 to stop the oscillation of switching pulses.

3-2 Charger Circuit

This circuit provides control over battery charging. When no battery is connected with the battery connector, +12V DC is supplied from the 4 Pin DC output connector to the camera head, but when a battery is connected with the battery connector, the +12V DC output becomes ineffective.

When no battery is connected with the battery terminals, the positive terminal and movable terminal of the battery connector are short-circuited and the +12V DC input from the power board is output from the 4 Pin DC output connector, but Q5 goes ON because its base is set at H level.

Therefore, the collector of Q5 goes low (L) level and Q3 goes OFF, thus prohibiting the operation of the charger control circuit.

When a battery is connected with the battery connector, the positive terminal and movable terminal of the battery connector are opened, therefore, Q5 goes OFF and Q3 goes ON, thus enabling the charger control circuit operation.

IC2 is a +5V three terminals regulator and converts +12V DC input to +5V DC.

Q6 is a control circuit to change current slowly when battery charging is started, and its output is supplied to pin 2 of hysteresis comparator IC1(a).

Pin 3 of comparator IC1(a) monitors the voltage at the positive terminal of the battery connector and upon detection of the full charging of the battery, turns Q1 ON due to L level at pin 1 of IC1(a), and thereby limiting the current at the termination of the charging.

VR1 (CHARGE VOLTAGE) is controlled for preset the charge voltage.

VR2 (CHARGE CURRENT 1) of pin 6 comparator IC1(b) is for charge current adjustment at the time of fast charging, and VR3 (CHARGE CURRENT 2) of pin 5 is for charge current adjustment at the time of slow charging.

4. 5" Viewfinder WV-VF65

The 5" viewfinder contains following circuits.

4-1 +12V DC, +9V DC Regulator Circuit
4-2 Video Amplifier Circuit
4-3 Sync Separation Circuit
4-4 Vertical Deflection Circuit
4-5 Horizontal Deflection Circuit
4-6 High Voltage Circuit
4-7 Tally Indicator Drive Circuit

4-1 +12V DC, +9V DC Regulator Circuit

This circuit generates the +12V DC and +9V DC power by regulating the +12V DC supplied from the camera head or remote control unit (RCU). The +12V is sent to heater of the cathode ray tube (CRT). The +9V is fed to all circuit in the viewfinder as a power source.

The +12V DC power from the camera head is applied and pin 3 of CN1 to the emitter of Q5, Q6 and pin 1 of IC1 respectively.

Approx. 120KHz triangular signal is also generated in triangle oscillator (OSC) inside IC1 and fed to the switching amplifier inside IC1.

The frequency of triangle oscillator (OSC) is set by VR2 (SWITCHING FREQ. ADJ).

* +12V Regulator

The reference +5V DC voltage supplied to pin 11 of IC1 and +12V output DC supplied to pin 10 of IC1 are compared by the differential amplifier inside IC1. The error output DC voltage corresponding to the +12V DC voltage error and triangular signal supplied from triangle OSC are compared by the comparator amplifier and the switching pulse output whose width is controlled by the error DC voltage appears at pin 9 of IC1.

This switching pulse is applied to the base of switching transistor Q6 switching ON and OFF Q6 through buffer Q1 and Q2.

As a result, the DC voltage whose level is set by the switching pulse width (pulse duty) is obtained at the output of switching regulator circuit consisting of Q6, D2 and L4. The generated DC voltage is fed back to pin 10 of IC1 through VR2 to maintain constant output voltage.

VR2 (+12V ADJ) is a control for +12V output voltage. The regulated +12V is then supplied to other circuit as a power through the filters consisting of L4/C9 and L5/C10.

* **+9V Regulator**

The reference DC voltage supplied to pin 4 of IC1 whose level is set by VR1 (+9V ADJ) and +9V output DC supplied to pin 5 of IC1 are compared by the differential amplifier inside IC1. The error output DC voltage corresponding to the +9V DC voltage error and triangular signal supplied from triangle OSC are compared by the comparator amplifier and the switching pulse output whose width is controlled by the error DC voltage appears at pin 7 of IC1. This switching pulse is applied to the base of switching transistor Q5 switching ON and OFF Q5 through buffer Q3 and Q4.

As a result, the DC voltage whose level is set by the switching pulse width (pulse duty) is obtained at the output of switching regulator circuit consisting of Q5, D1 and L2. The generated DC voltage is fed back to pin 5 of IC1 to maintain constant output voltage.

The regulated +9V is then supplied to other circuits as a power through the filters consisting of L2/C6 and L3/C7. When the camera is used STANDBY position, High(H) level is fed to the base of Q9 and turns ON Q9. DC output from +9V DC regulator IC1 is cut off.

4-2 Video Amplifier Circuit

This circuit amplifies the video signal supplied from the camera head. The amplified video signal is supplied to the cathode ray tube (CRT).

The video signal at pin 1 of CN2 is fed to amplifier Q2 and Q3 through buffer Q1 and VR1 (CONTRAST). The amplified video signal at the collector of Q3 is sent through buffer Q4, D2 and D1 to the emitter of amplifier Q6. The vertical (V) sawtooth signal is supplied from the V deflection circuit to the base of switching amplifier Q5 to generate the V blanking (BL) pulse. The V BL pulse at the collector of Q5 is mixed with the video signal for eliminating the vertical retrace line on the CRT screen.

The amplified video signal which is mixed with the level indicator signal and the V BL pulse is applied from the collector of Q6 through L2/R23 and pin 3 of CN4 to grid-1 of CRT.

The voltage which is set by VR2 (BRIGHT) and VR3 (SUBBRIGHT) is fed through buffer Q7, D4 and pin 4 of CN4 to cathode (K) of CRT to set the brightness of CRT screen. The flyback pulse sent from the high voltage circuit through pin 2 of CN3 to D5 is mixed with brightness-controlled DC voltage and supplied to cathode (K) to eliminating the horizontal retrace line on the CRT. When SW1 (PEAKING ON/OFF is set to the ON position, the frequency response at 3MHz portion of video signal is boosted for making focus of picture on the viewfinder easily.

4-3 Sync Separation Circuit

This circuit separates the sync signal from the video signal supplied from the camera and sends it to other circuit.

The video signal obtained at the emitter of buffer Q1 in the video amplifier circuit is applied to sync separator Q8 which detects only the sync signal. The sync signal at the collector of Q8 is sent to the horizontal deflection circuit. The separated sync is fed through buffer Q9 to integrator consisting of R38/C20 and R39/C21 where the horizontal (H) sync is removed and only the vertical (V) sync remains. The V sync signal is sent to the vertical deflection circuit through R40 and C25.

4-4 Vertical Deflection Circuit

This circuit generates vertical (V) deflection sawtooth current for vertical scanning of beam inside the cathode ray tube (CRT).

The positive V sync signal is supplied from the sync separation circuit to V oscillator Q100 as a trigger pulse: Q100 is a free-running V sawtooth generator using positive feedback and works as follows.

When the power switch is turned ON, potential at the collector of Q100 becomes low (L) momentarily due to discharge of C101 and C102, and then gradually increases with the time constant of R107, VR103 (V SIZE), R106, C101, C102 and R104 (Ⓐ). At the same time, the base voltage of Q100 also increases gradually since the collector potential of Q100 is fed back to it base through buffer Q101 and VR100 (V HOLD). Q100 turned ON when its base potential exceeds the specific level. When Q100 is turned ON, C101 and C102 begin to be discharged, and the trigger signal Ⓓ, which is made by filtering the V deflection signal Ⓒ with R112, C104 and C103, is positively fed back to the base of Q100 in order to keep turning ON Q100 until C101 and C102 are fully discharged.

When C101 and C102 are fully discharged, the base voltage of Q100 becomes L level turning it OFF and C101 and C102 begin to be charged again through R107, VR103. As a result, the V sawtooth signal is kept generating.

When the V sync signal is fed to Q100, Q100 generates the V sawtooth signal whose frequency and phase coincide with the V sync signal.

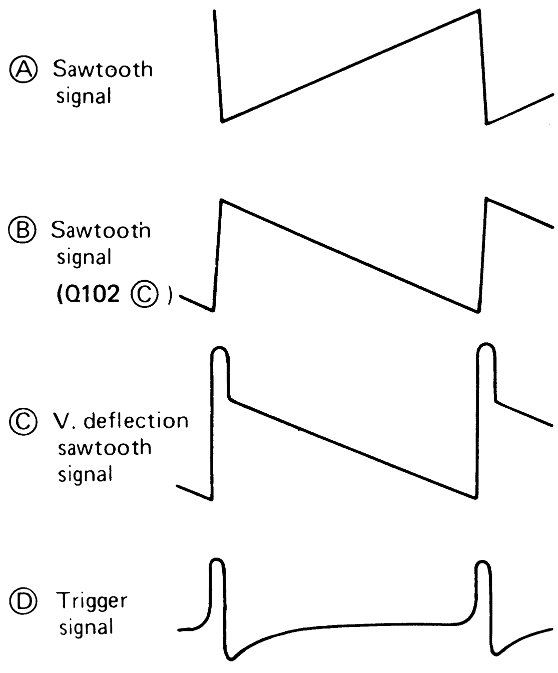


Fig. 4-4 Vertical Sawtooth Signal Generation

The V sawtooth signal thus generated is fed through buffer Q101, amplifier Q102, V deflection output Q103/Q104 and pin 3 of CN7 to the V deflection coil. The V sawtooth signal at the emitter of Q101 is integrated by R109, VR102 (V LIN) and C102 into the V parabola signal and it is fed back to V sawtooth generator Q100 for V linearity correction.

VR100 (V HOLD) is a control for setting the oscillating frequency of Q100 in the steady state.

4-5 Horizontal Deflection Circuit

This circuit generates horizontal deflection sawtooth current for horizontal scanning of beam inside the cathode ray tube (CRT).

The horizontal (H) sync signal is supplied from the sync separation circuit through pin 3 of CN5 and pin 1 of IC202 to the phase comparator where the H sync signal is compared in phase with the H sawtooth signal supplied to pin 3 of IC202. The phase difference between two signal is converted into the DC voltage which is sent to the H oscillator to control oscillating frequency. The oscillated pulse is then fed through the H drive circuit and step-up transformer T201 to H deflection output Q206. The H sawtooth current is sent from the emitter of Q206 through the H deflection coil, L4 and L3 (H SIZE) into its collector.

The H flyback pulse at the emitter of Q206 is integrated by R231 and C214 into the V parabola signal, which is sent to the phase comparator. The H flyback pulse is also sent to the high voltage circuit.

4-6 High Voltage Circuit

This circuit generates high voltages for cathode ray tube (CRT) electrodes.

The flyback pulse generated in the horizontal (H) deflection circuit is supplied to the primary winding of the flyback transformer (FBT) T200 to step up the flyback pulse to necessary level.

The boosted pulses obtained at the secondary winding of FBT are rectified to generate high voltages.

+9KV generated by rectifying the boosted pulse in T200 and obtained at pin A of T200 is fed to the CRT anode.

+390V obtained by rectifying the boosted pulse at pin 5 of T200 with D210 is sent to grid-2 (G2). The voltage which is set by VR203 (FOCUS) is applied to grid-3 (G3). +120V obtained by rectifying the boosted pulse at pin 6 of T200 with D211 is fed to the video amplifier circuit as a power source. The boosted H flyback pulse obtained at pin 6 of T200 is supplied to the video amplifier circuit to make the H BL pulse which eliminates the H retrace line on the CRT screen.

4-7 Tally Indicator Drive Circuit

This circuit lights ON or OFF the tally lamp and the control signal sent from the camera.

When the camera is selected in the system using the special effects generator, the high (H) level is sent to switching transistor Q8 to turn ON Q8 and Q7. As a result, +12V is fed to tally lamp PL1 on the front of camera to light it ON. When the SW2 (TALLY ON/OFF) is set to the OFF position, the tally lamp PL1 does not light. At the same time, the high(H) level is fed to switching transistor Q207 to turn ON Q207. Therefore, the collector of Q207 is grounded and the tally LED D213 on the rear of viewfinder lights.

ADJUSTMENT PROCEDURE

1. Test Equipment Required

The following test equipment is required for adjustment of Remote Control Unit (RCU) model WV-RC33, RCU/Gen-lock Adaptor Model WV-AD33, AC Adaptor/Charger model WV-PS31 and 5" Viewfinder WV-VF65.

- o Oscilloscope
  (dual trace, delayed sweep, 30MHz band width with three probes.)
- o Digital voltmeter (DVM)
- o Special Effects Generator (SEG) or Signal Generator
- o Frequency counter
- o Vectorscope
- o Waveform monitor
- o Color video monitor
- o DC currentmeter
- o Tripod mounting adaptor (WV-Q36)
- o Tripod
- o DC power 12V more than 2.5A
- o Lighting : 1400 lux (140 footcandles), 3200° K
- o Logarithmic gray scale chart (Parts No. YWV2310RB99)

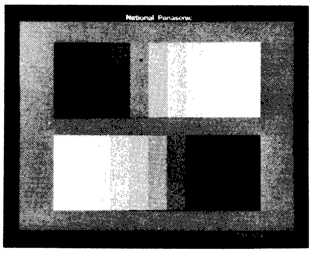


Fig. 1-1-1

2. Disassembling Procedure for Adjustment

2-1. Remote Control Unit WV-RC33

o Remove six screws which hold the upper cover and remove the upper cover. (Fig. 2-1-1)

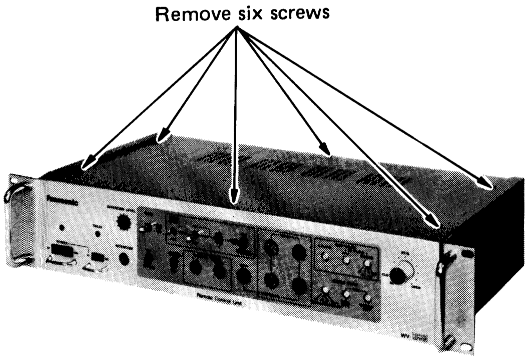


Fig. 2-1-1

2-2. RCU/Gen-lock Adaptor WV-AD33

o Remove six screws which hold the rear cover and remove the rear cover. (Fig. 2-2-1)

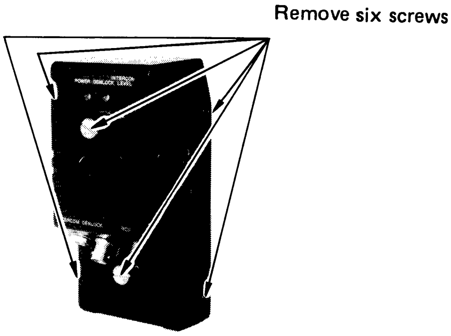


Fig. 2-2-1

o Remove four screws which hold the Gen-lock board and remove the Gen-lock board. (Fig. 2-2-2)

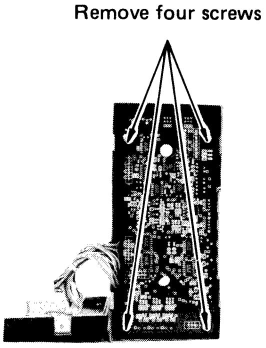


Fig. 2-2-2

2-3. AC Adaptor/Charger WV-PS31

o Remove six screws which hold the upper cover and remove the upper cover. (Fig. 2-3-1)

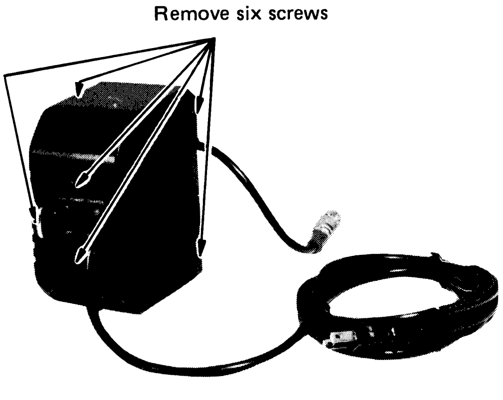


Fig. 2-3-1

2-4 5" Viewfinder WV-VF65

- o Remove five screws fixing the upper cover and remove the cover. (Fig. 2-4-1)

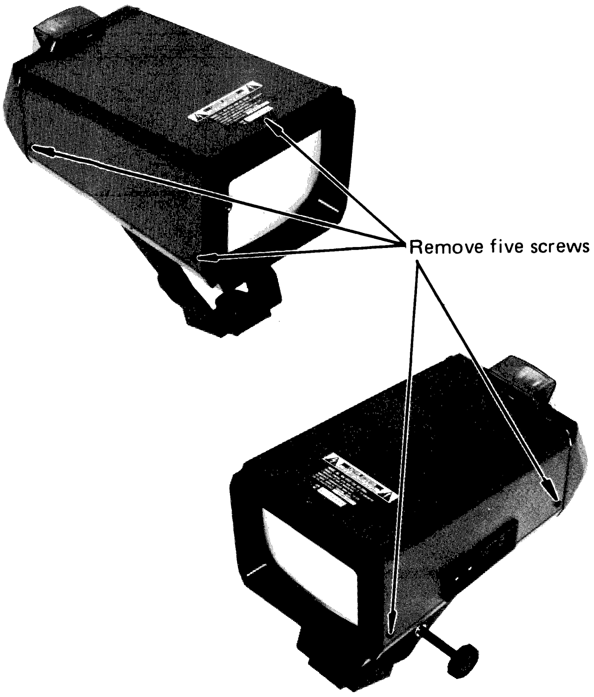


Fig. 2-4-1

3 Adjustment Procedure

3-1 5" Viewfinder WV-VF65 Adjustment

- o Refer to page 33 for the test points and adjusting controls.

Setting up for adjustment

Position of controls and switches on the camera

(Camera)
Power Switch . . . . .VTR/RCU
Filter Wheel 1
High Gain Selection Switch . .0 dB
AGC Switch. . . . . .OFF
Color Bar/Camera
  Selection Switch. . . . . .CAMERA
White Balance Switch. . . . . .PRESET
LEVEL IND
  ON/OFF SWITCH. . . . . . .OFF
(Lens)
Iris Control Ring . . . . .A

Set-up

- o Turn ON the color camera for at least 30 minutes prior to adjustment.
- o Distance between the camera and test chart should be more than 2m (6 feet).
- o Light : 1400 lux (140 footcandles) incident.

(a) Switching frequency adjustment

Test point :	TP1 (SW FREQ.)	Power board
Adjust :	VR2 (SW FREQ. ADJ)	Power board

- o Connect the frequency counter to TP1 (SW FREQ.) on the power board.
- o Adjust VR2 (SW FREQ. ADJ) on the power board for 120.5 KHz ± 0.2 KHz.

(b) +12V adjustment

Test points :	TP2 (+12V)	Power board
Adjust :	VR3 (+12V ADJ)	Power board

- o Remove the screws fixing the printed circuit boards. (Fig. 3-1-1).

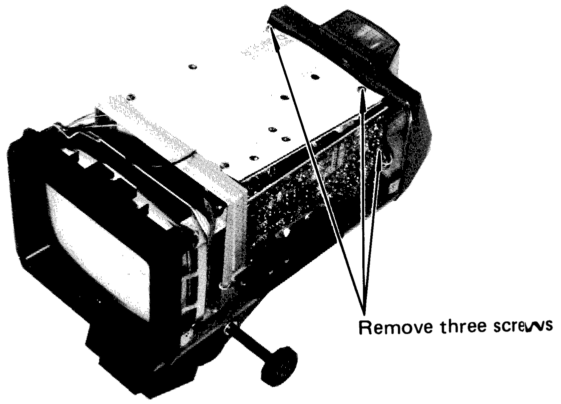


Fig. 3-1-1

- o Loosen two screws holding the front panel (Fig. 3-1-2) and remove the front panel. (Fig. 3-1-3)

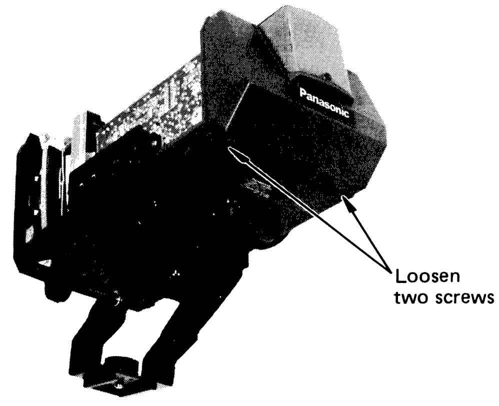


Fig. 3-1-2

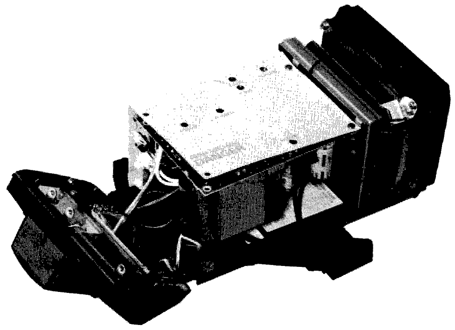


Fig. 3-1-3

- Connect the digital voltmeter (DVM) to TP2 (+12V) on the Power board.
- Adjust VR3 (+12V ADJ) for +12V ± 0.05V.

(c) +9V adjustment

Test points :	TP3 (+9V)	Power board
Adjust :	VR1 (+9V ADJ)	Power board

- Connect the DVM to TP3 (+9V) on the Power board.
- Adjust VR1 (+9V ADJ) for +9V ± 0.05V.

(d) Horizontal and vertical hold preset adjustment

Adjusts :	VR100 (V.HOLD)	Deflection board
	VR202 (H.HOLD)	Deflection board

- While observing the viewfinder, adjust VR100 (V HOLD) and VR202 (H HOLD) so that picture in the viewfinder is locked vertically and horizontally.

(e) Centering magnets adjustment

Adjusts :	L3 (H SIZE)	Deflection board
	VR103 (V SIZE)	Deflection board
	Centering magnets	
Observe :	Viewfinder	

- Reduce picture size using L3 (H SIZE) and VR103 (V SIZE) so that the entire raster is observed on the viewfinder.
- Cap on the lens or set the filter wheel 4.
- Adjust the centering magnets (See Fig. 3-1-4) so that the raster comes to the center of viewfinder screen. (Fig. 3-1-5)

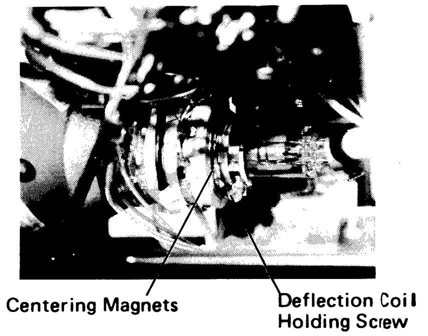


Fig. 3-1-4

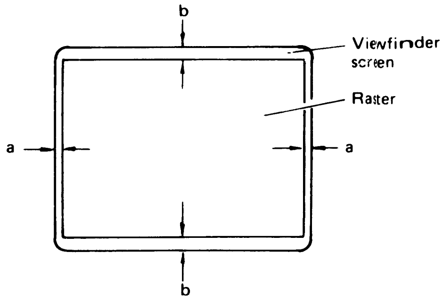


Fig. 3-1-5

(f) Picture tilt adjustment

Adjust :	Deflection coil
Observe :	Viewfinder

- Loosen the deflection coil holding screw. (Fig. 3-1-4)
- Observe the viewfinder and turn the deflection coil so that the image is straight.
- Tighten the deflection coil holding screw.

(g) Horizontal and vertical size, vertical linearity adjustment

Adjusts :	L3 (H SIZE)	Deflection board
	VR103 (V SIZE)	Deflection board
	VR102 (V LIN)	Deflection board
Observe :	Viewfinder	

- Aim the camera at the registration chart.
- Set VR1 (CONTRAST) and VR2 (BRIGHT) to the optimum position.
- Adjust L3 (H SIZE) so that the horizontal size of raster is 3-3/4 ~ 1/16 (9.5 ± 0.1cm).
- Adjust VR102 (V LIN) and VR103 (V SIZE) repeatedly so that the circle in the chart is as rearly a true circle as possible.

  Note : If the picture jumps or rolls vertically in this adjustment, readjust VR100 (V HOLD).

(h) Horizontal and vertical hold adjustment

Test points :	Pin 3 of CN4	Video amp board
	Pin 4 of CN4	Video amp board
Adjusts :	VR100 (V HOLD)	Deflection board
	VR202 (H HOLD)	Deflection board
Observe :	Viewfinder	

- While observing the viewfinder, turn VR100 (V HOLD) clockwise and counterclockwise to confirm the vertical hold range of VR100
- Set VR100 to the mechanical center of its vertical hold range.
- Connect the oscilloscope to pin 3 and pin 4 of CN4.
- Trigger the oscilloscope at H rate.
- Adjust VR202 (H HOLD) so that the leading edge of horizontal blanking pulse at pin 4 coincides with the leading edge of blanking duration at pin 3. (Fig. 3-1-6)

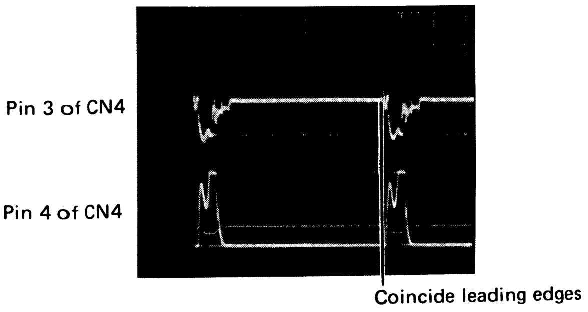


Fig. 3-1-6

- Turn ON and OFF the power switch and confirm that the picture in the viewfinder is locked horizontally and vertically.
- Confirm that the raster positions at the center of viewfinder screen. If not, readjust (e) Centering magnets adjustment.

(i) Subbright adjustment

Adjusts :	VR1 (CONTRAST)	Video amp board
	VR2 (BRIGHT)	Video amp board
	VR3 (SUBBRIGHT)	Video amp board
Observe :	Viewfinder	

- Turn VR1 (CONTRAST) and VR2 (BRIGHT) fully counterclockwise.
- Turn VR2 (BRIGHT) about 45° so that the slit of bright control knob positions level. (Fig. 3-1-7)

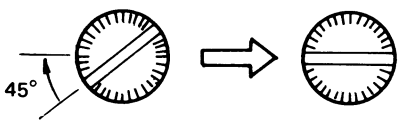


Fig. 3-1-7

- Adjust VR3 (SUBBRIGHT) so that the raster just disappears.

(j) Contrast and bright adjustment

Adjusts :	VR1 (CONTRAST)	Video amp board
	VR2 (BRIGHT)	Video amp board
Observe :	Viewfinder	

- Aim the camera at the logarithmic gray scale chart.
- While changing the iris from the closed position to F1.4, adjust VR1 (CONTRAST) and VR2 (BRIGHT) so that the black-and-white chip gradations will be the same on the viewfinder as that in the monitor.

(k) Focus Adjustment

Adjust :	VR203 (FOCUS)	Deflection board
Observe :	Viewfinder	

- Aim the camera at the resolution chart.
- Adjust VR203 (FOCUS) for best resolution in the viewfinder.

3-2. Remote Control Unit (RCU) WV-RC33 Adjustment

- o Disassemble the Remote Control Unit (RCU) while referring to 2-1 Remote Control Unit WV-RC33 on page 20.
- o Refer to pages 34 and 35 for the test points and adjustment controls.

(a) Connection and setting up for adjustment

Connection

- o Mount the RCU/Gen-lock Adaptor WV-AD33 on the camera while connecting the 32 pin junction connector on the camera and the RCU/Gen-lock adaptor.
- o Turn the two lock screws clockwise to mount the RCU/Gen-lock Adaptor WV-AD33 securely.
- o Connect the RCU/Gen-lock Adaptor WV-AD33 and RCU using a 10m (30ft) 14 pin studio cable (14C-30).
- o Connect the VIDEO OUTPUT connector on the RCU to the VIDEO INPUT connector of color monitor through the waveform monitor and the vectorscope using a coaxial cable.
- o Terminate the video input of color monitor with 75 ohms.
- o Connect the BLACK BURST OUT of Special Effects Generator (SEG) or Signal Generator to the GEN-LOCK IN connector of RCU using a coaxial cable and set the 75 ohms termination switch to 75 ohms position when instructed.

Position of controls and switches on the camera, lens and RCU.

(Camera)

Power Switch	VTR/RCU
Filter Wheel	1
High Gain Selection Switch	0 dB
Color Bar/Camera Selection Switch	CAMERA
Standby/Operate Selection Switch	OPERATE
White Balance Selection Switch	P SET

(Lens)

Iris Control Selection Switch	MAN

(RCU)

Color Bar/Camera Selection Switch	CAMERA
Cable Length Compensation Switch	10m (30ft)
High Gain Selection Switch	0 dB
Check ON/OFF Switch	OFF
White Balance Selection Switch	MANUAL
Red Gain Control	Center
Blue Gain Control	Center
Total Pedestal Control	Center
Red Pedestal Control	Center
Blue Pedestal Control	Center
Horizontal Phase Control	Center
Subcarrier phase Fine Control	Center
Subcarrier Phase Coarse Control	0°
Total Gain Fine Control	Center
Chroma Gain Fine Control	Center

Set-up

- o Turn ON the color camera and RCU for at least 30 minutes prior to adjustment.
- o Distance between the camera and test chart should be more than 2m (6ft).
- o Light : 1400 lux (140 footcandles) incident.

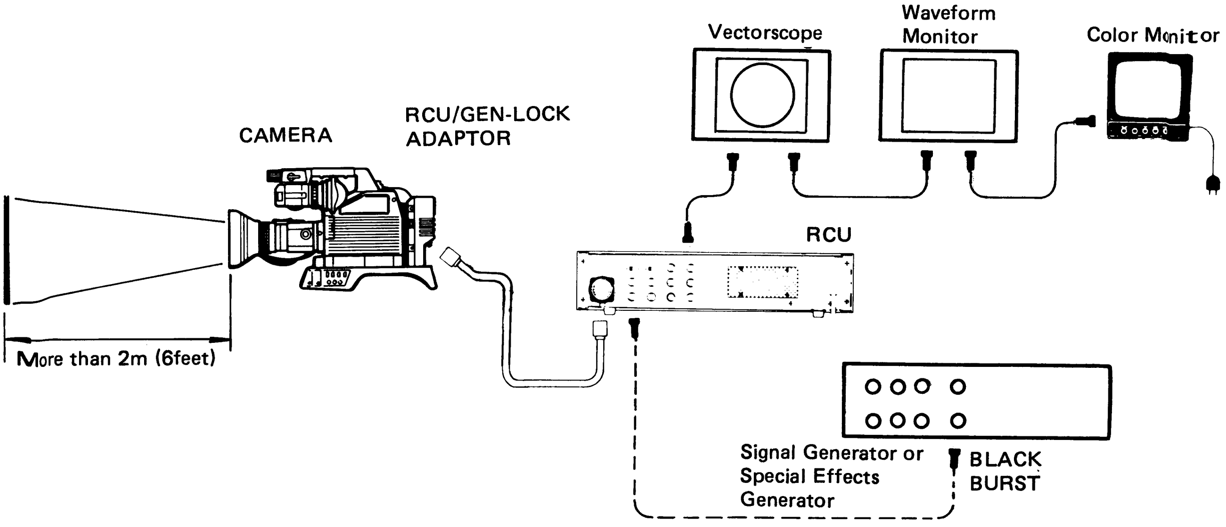


Fig. 3-2-1

- The camera must be completely aligned before RCU adjustment is made.

(b) +17V switching frequency adjustment

Test point:	TP1 (SWITCHING FREQ.)	Power board
Adjust :	VR2 (SWITCHING FREQ. ADJ)	Power board

- Connect the frequency counter to TP1 (SWITCHING FREQ.) and ground.
- Adjust VR2 (SWITCHING FREQ. ADJ) for 120.5 kHz ± 0.2kHz.

(c) +17V adjustment

Test point :	TP3 (+17V CONTROL)	Power board
Adjust :	VR1 (+17V ADJ)	Power board

- Turn OFF the Power Switch on the front of RCU.
- Disconnect 14 pin studio cable from RCU/Gen-lock Adaptor WV-AD33.
- Turn ON the Power Switch on the front of RCU.
- Connect the digital voltmeter (DVM) probe between TP3 (+17V CONTROL) and ground.
- Adjust VR1 (+17V ADJ) for +17.0V ± 0.05V.
- Turn OFF the Power Switch on the front of RCU.
- Connect the 14 pin studio cable to RCU/Gen-lock Adaptor WV-AD33.
- Turn ON the Power Switch on the front of RCU.

(d) +12V switching frequency adjustment

Test point :	TP4 (SW FREQ.)	Video board
Adjust :	VR6 (+12V SWITCHING FREQ.)	Video board

- Connect the frequency counter to TP4 (SW FREQ.) and ground.
- Adjust VR6 (+12V SWITCHING FREQ.) for 120.5 kHz ± 0.2kHz.

(e) +12V adjustment

Test point :	J1 (+12V)	Video board
Adjust :	VR7 (+12V ADJ)	Video board

- Connect the digital voltmeter (DVM) probe between J1 (+12V) and ground.
- Adjust VR7 (+12V ADJ) for +12.0V ± 0.05V.

(f) Burst gate adjustment

Test points :	TP1 (GEN-LOCK IN)	Video board
	TP2 (BURST GATE)	Video board
Adjust :	VR1 (BURST GATE)	Video board

- Connect the BLACK BURST OUT of Special Effects Generator or Signal Generator to the GEN-LOCK IN connector of RCU.
- Connect the oscilloscope to TP1 (GEN-LOCK IN) and TP2 (BURST GATE).
- Trigger the oscilloscope at H.rate. (Use TP9 (BL), Deflection board for camera.)
- Expand the burst signal portion on the oscilloscope.
- Adjust VR1 (BURST GATE) so that the rising edge of burst gate pulse at TP2 lags 4 μsec ± 0.1 μsec the rising edge of black burst signal at TP1. (Fig. 3-2-2)

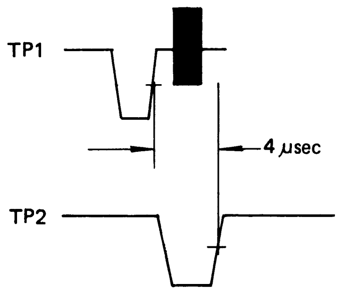


Fig. 3-2-2

(g) Black burst adjustment

Test point :	TP3 (GEN-LOCK OUT)	Video board
Adjusts :	VR1 (SC 90° PHASE)	SC board
	VR4 (SYNC LEVEL)	Video board
	VR5 (BLACK BURST LEVEL)	Video board

- Keep the BLACK BURST OUT of Special Effects Generator (SEG) or Signal Generator to the GEN-LOCK IN connector of RCU.
- Cap on the lens or set the filter wheel to the position 4.
- Supply the subcarrier (SC) signal from the Special

Effects Generator (SEG) or Signal Generator to the EXT CW ϕ REF connector on the rear of the vectorscope to EXT position.

- o Set VR4 (SYNC LEVEL) and VR5 (BLACK BURST LEVEL) to their mechanical center.
- o Set the Subcarrier Phase Coarse Switch on the front of RCU to the 0° position and turn Subcarrier Phase Fine Control on the front of RCU fully counterclockwise.
- o Turn the phase control of vectorscope so that the burst vector position at the R-Y axis of vectorscope.
- o Set the Subcarrier Phase Coarse Switch on the front of RCU to the 90° position.
- o Adjust VR1 (SC 90° PHASE) so that the burst vector coincides with the R-Y axis on the vectorscope.
- o Reset the Subcarrier Phase Coarse Switch on the front of RCU to the 0° position.
- o Connect the oscilloscope to TP3 (GEN-LOCK OUT).
- o Trigger the oscilloscope at H.rate. (Use TP9 (BL), Deflection board for camera.)
- o Adjust VR4 (SYNC LEVEL) so that the sync level is 0.35V±0.01V and adjust VR5 (BLACK BURST LEVEL) so that the burst level is 0.3V±0.01V. (Fig. 3-2-3)

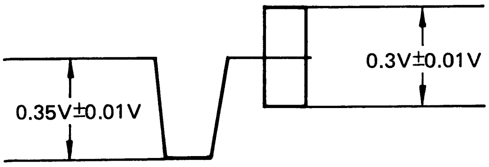


Fig. 3-2-3

(h) AUX gain adjustment

Test point :	AUX INPUT	
	TP6 (AUX OUT)	Video board
Adjust :	VR8 (AUX LEVEL)	Video board

- o Connect the VIDEO OUTPUT connector and the AUX INPUT connector on the rear of RCU using a coaxial cable.
- o Set the AUX input termination switch to the 75 ohms position.
- o Aim the camera at the logarithmic gray scale chart.
- o Connect the oscilloscope to the AUX INPUT connector on the rear of RCU.
- o Trigger the oscilloscope at H.rate. (Use TP9 (BL), Deflection board for camera.)
- o Set the lens iris so that the video signal becomes 0.7V ±0.01V.
- o Keep the oscilloscope to AUX INPUT connector on the rear of RCU and connect the oscilloscope to TP6 (AUX OUT).
- o Adjust VR8 (AUX LEVEL) so that the signal levels especially the sync signals are equal.

3-3 RCU/Gen-lock Adaptor WV-AD33 Adjustment

- o Disassemble the RCU/Gen-lock Adaptor WV-AD33 while referring to 2-2 RCU/Gen-lock Adaptor WV-AD33 on page 20.
- o Refer to page 32 for the test points and adjustment controls.

(a) Connection and setting up for adjustment

Connection

- o Mount the RCU/Gen-lock Adaptor WV-AD33 on the camera while connecting the 32 pin junction connector on the camera and the RCU/Gen-lock Adaptor.
- o Turn the two lock screws clockwise to mount the RCU/Gen-lock Adaptor WV-AD33 securely.
- o Connect the VIDEO OUTPUT connector on the left side of camera to the VIDEO INPUT connector of color monitor through the waveform monitor and the vectorscope using a coaxial cable.
- o Terminate the video input of color monitor with 75 ohms.
- o Supply +12V DC to the EXT DC connector of camera from the DC power or the AC Adaptor/Charger WV-PS31.

Position of controls and switches on the camera, lens and RCU/Gen-lock Adaptor

(Camera)	
Power Switch	EXT/BATT/AC ADP
Filter Wheel	1
High Gain Selection Switch	0 dB
Color Bar/Camera Selection Switch	BAR
Standby/Operate Selection Switch	OPERATE
White Balance Selection Switch	P SET
(Lens)	
Iris Control Selection Switch	AUTO
(RCU/Gen-lock Adaptor)	
Horizontal Phase Control	Center
Subcarrier Phase Fine Control	Center
Subcarrier Phase Coarse Switch	0°

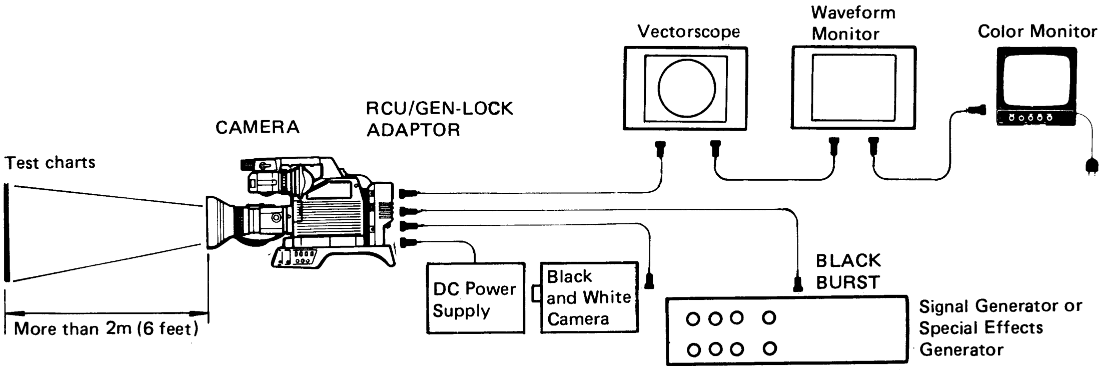

Vectorscope
Waveform Monitor
Color Monitor
RCU/GEN-LOCK ADAPTOR
CAMERA
Test charts
BLACK BURST
DC Power Supply
Black and White Camera
Signal Generator or Special Effects Generator
More than 2m (6 feet)

Fig. 3-3-1

Set-up

- o Turn ON the color camera for at least 30 minutes prior to adjustment.
- o Distance between the camera and test chart should be more than 2m (6 feet).
- o Light : 1400 lux (140 footcandles) incident.
- o The camera must be completely aligned before RCU/Gen-lock Adaptor adjustment is made.

(b) 4.43MHz adjustment

Test point :	TP11 (SC1)	Gen lock board
Adjust :	CT4 (4.43MHz ADJ)	Gen-lock board

- o Connect the frequency counter to TP11 (SC1) and ground.
- o Adjust CT4 (4.43MHz ADJ) for 4,433,618Hz ±3Hz.

(c) Interleaving adjustment

Test point :	TP1 (INTERLEAVING)	Gen-lock board
Adjust :	CT1 (INTERLEAVING)	Gen-lock board

- o Connect the oscilloscope to TP1 (INTERLEAVING)
- o Set the input coupling selector on the oscilloscope to DC position.
- o Adjust CT1 (INTERLEAVING) for 1.8V±0.2V.
- o Aim the camera to the color chart and observe the vectorscope.
- o Confirm that the vectors toward to their respective boxes on the vectorscope.
- o If not, readjust CT1 (INTERLEAVING) so that the vector on the vectorscope is locked.

(d) Sync lock adjustment

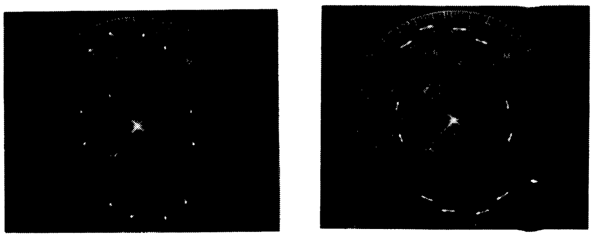
Test point :	TP2 (SYNC LOCK) Gen-lock board
Adjust :	CT2 (SYNC LOCK) Gen-lock board

- o Supply the color bar or black burst signal to Gen-lock connector of RCU/Gen-lock Adaptor from signal generator or special effects generator.
- o Connect the DVM to TP2 (SYNC LOCK).
- o Adjust CT2 (SYNC LOCK) for 2.5V±0.2V.

(e) Subcarrier lock adjustment

Test point :	TP3 (SC LOCK)	Gen-lock board
Adjust :	CT3 (SC LOCK)	Gen-lock board

- o Supply the color bar or black burst signal to Gen-lock connector.
- o Connect the DVM to TP3 (SC LOCK).
- o Adjust CT3 (SC LOCK) for 1.6V±0.2V.
- o Confirm that the jitter of color bar on the vectorscope is minimum. (Fig. 3-3-2)



GOOD **NO GOOD**

Fig. 3-3-2

(f) Gen-lock SC phase adjustment

Adjust :	CT5 (G/L SC PHASE)	Gen-lock board
Observe :	Vectorscope	

- Connect the vectorscope to the VIDEO OUTPUT connector on the left side of camera.
- Observer the vectorscope.
- Adjust CT5 (G/L SC PHASE) so that the gain of two bursts become equal. (Fig. 3-3-3)

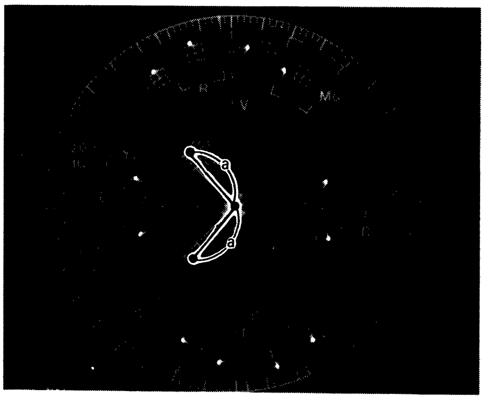


Fig. 3-3-3

(g) Horizontal phase adjustment

Test point :	Pin 6 of CN1 (GEN-LOCK)	Gen-lock board
	Pin 4 of CN1 (H.PHASE)	Gen-lock board
	TP10 (C.SYNC)	Gen-lock board
Adjust :	VR3 (H.PHASE COARSE-2)	Gen-lock board
	VR4 (H.PHASE COARSE-1)	Gen-lock board
	VR1 (H.PHASE FINE)	Gen-lock board

- Keep the BLACK BURST OUT of Special Effects Generator (SEG) or Signal Generator to the GEN-LOCK INPUT connector of RCU/Gen-lock Adaptor WV-AD33 using a coaxial cable.
- Turn VR1 (H.PHASE),VR3 (H.PHASE COARSE-2) and VR4 (H.PHASE COARSE-1) to their mechanical center.
- Connect the DVM to pin 4 of CN1 (H.PHASE).
- Adjust VR1 (H.PHASE) for 3.6V.
- Trigger the oscilloscope at H.rate. (Use TP9(SYNC) Gen-lock board.)
- Expand the H.sync period on the oscilloscope.
- Adjust VR3 (H.PHASE COARSE-2) so that the sync of gen-lock signal at TP10 lag 1.5 µsec the sync signal at TP10.
- Confirm that the sync of gen-lock signal at TP10 leads by more than 0.5 µsec and lags more than 2.5 µsec sync signal at TP10 as VR1 (H.PHASE FINE) is turned through its range. (Fig. 3-3-4).

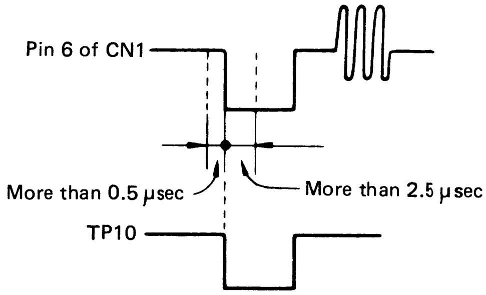


Fig. 3-3-4

- After confirming the above step, adjust VR1 so that the leading edges of both sync signals are coincident.

(h) Confirmation of subcarrier phase

Test point :	VIDEO OUT	
Adjusts :	VR2 (SC PHASE FINE)	Gen-lock board
	SW1 (SC PHASE COARSE SWITCH-1)	Gen-lock board
	SW2 (SC PHASE COARSE SWITCH-2)	Gen-lock board
Observe :	Vectorscope	

- Connect the BLACK BURST OUT of Special Effects Generator (SEG) or Signal Generator to the GEN-LOCK INPUT connector of RCU/Gen-lock Adaptor WV-AD33 using a coaxial cable.
- Supply the subcarrier (SC) signal from the Special Effects Generator (SEG) or Signal Generator to the EXT CW ϕ REF connector on the rear of vectorscope to EXT position.
- Set the SW1 (SC PHASE COARSE SWITCH-1) and SW2 (SC PHASE COARSE SWITCH-2) to the 0° position and turn VR2 (SC PHASE FINE) fully counterclockwise.

- Confirm that the burst phase changes more than 90°, 180° and 270° when SW1 and SW2 is set to the 90°, 180° and 270° position. (Fig. 3-3-3)
- Confirm that the burst phase changes more than 90°, when VR2 is turn back. (The burst phase changes more than 360° by setting SW1, SW2 and VR2)
- Reset SW1 and SW2 to the 0° position and return VR2 fully counterclockwise.

3-4 AC Adaptor/Charger WV-PS31

- Disassemble the AC Adaptor/Charger WV-PS31 while referring to 2-3 AC Adaptor/Charger WV-PS31 on page 20.
- Refer to page31 for the test points and adjustment controls.

(a) Connection and setting up for adjustment

Connection

- Mount the AC Adaptor/Charger WV-PS31 on the camera.
- Connect the VIDEO OUTPUT on the left side of camera to the VIDEO INPUT connector of color monitor to the VIDEO INPUT connector of color monitor using a coaxial cable.
- Terminate the video input of color monitor with 75 ohms.
- Connect the DC OUTPUT connector of AC Adaptor/Charger WV-PS31 to the EXT DC connector of camera.

Position of controls and switch on the camera and lens

(Camera)

Power Switch . . . . EXT/BATT/AD ADP
Filter Wheel 1
High Gain Selection Switch . . . . .0 dB
Color Bar/Camera Selection Switch. . . . . .CAMERA
Standby/Operate Selection Switch . . . . . .OPERATE
White Balance Selection Switch . . . . .P SET

(Lens)

Iris Control Selection Switch . . . . .AUTO

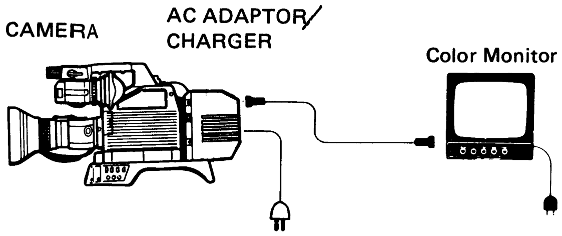


Fig. 3-4-1

(b) +13V adjustment

Test points:	TP2 (BATTERY)	Control board
	TP3 (GROUND)	Control board
Adjust :	R18 (+13V ADJ) or R55 (+13V ADJ)	Power board

- Connect the digital voltmeter (DVM) probe between TP2 (BATTERY) and TP3 (GROUND).
- Adjust R55 or R18 (+13V ADJ) for +13.0V±0.05V.

(c) Charge current adjustment

Adjusts :	VR1 (CHARGE VOLTAGE)	Control board
	VR2 (CHARGE CURRENT-1)	Control board
	VR3 (CHARGE CURRENT-2)	Control board
Observe :	DC currentmeter	

- Turn OFF the Power Switch on the rear of AC Adaptor/Charger WV-PS31.
- Remove the AC Adaptor/Charger WV-PS31 from the camera.
- Unsolder the one wire (BAT⊕) from J1 battery connector on the Control board.
- Connect the DC currentmeter between battery connector and BAT⊕ on the Control board. (Fig. 3-4-2)

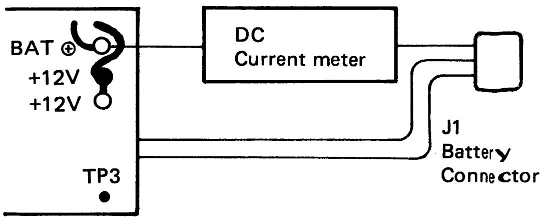


Fig. 3-4-2

- Turn ON the Power Switch on the rear of AC Adaptor/Charger WV-PS31.
- Turn VR3 (CHARGE CURRENT-2) and VR1 (CHARGE VOLTAGE) fully clockwise.
- Connect the empty battery WV-PS33 to the J1 battery connector.
- Confirm D4 (CHARGE IND) turn red.
- Adjust VR2 (CHARGE CURRENT-1) for 1A± 0.02A.
- Disconnect the empty battery WV-PS33 from the J1 battery connector.

- o Connect the fully charged battery WV-PS33 to the J1 battery connector.
- o Turn VR1 fully counterclockwise.
- o Adjust VR3 for 165mA ± 2mA.
- o Disconnect the fully charged battery WV-PS33 from the J1 battery connector.
- o Turn OFF the Power Switch on the rear of AC Adaptor/Charger WV-PS31.
- o Disconnect the DC currentmeter between battery connector and BAT⊕ on the Control board.
- o Solder the one wire (BAT ⊕) from J1 battery connector on the Control board.

(d) Charge voltage adjustment

Test points :	TP2 (BATTERY)	Control board
	TP3 (GROUND)	Control board
Adjust :	VR1 (CHARGE VOLTAGE)	Control board

- o Disconnect the AC code from the AC outlet.
- o Connect the digital voltmeter (DVM) probe between TP2 (BATTERY) and TP3 (GROUND).
- o Supply DC voltage A between TP2 (BATTERY) and TP3 (GROUND).
- o Adjust DC voltage A so that the DC voltage A as shown Fig. 3-4-3 on the DVM.
- o Turn VR1 (CHARGE VOLTAGE) fully clockwise and turn it back slowly and stop it when the D4 (CHARGE IND) just turn from red to green.

Room Temperature	DC Voltage A
Less than 11.5°C (52.7°F)	16.60V
Between 11.5°C (52.7°F) and 14.5°C (58.1°F)	16.48V
Between 14.5°C (58.1°F) and 17.5°C (63.5°F)	16.36V
Between 17.5°C (63.5°F) and 20.5°C (68.9°F)	16.23V
Between 20.5°C (68.9°F) and 23.5°C (74.3°F)	16.11V
Between 23.5°C (74.3°F) and 26.5°C (79.7°F)	16.00V
Between 26.5°C (79.7°F) and 29.5°C (85.1°F)	15.89V
Between 29.5°C (85.1°F) and 32.5°C (90.5°F)	15.76V
More than 32.5°C (90.5°F)	15.65V

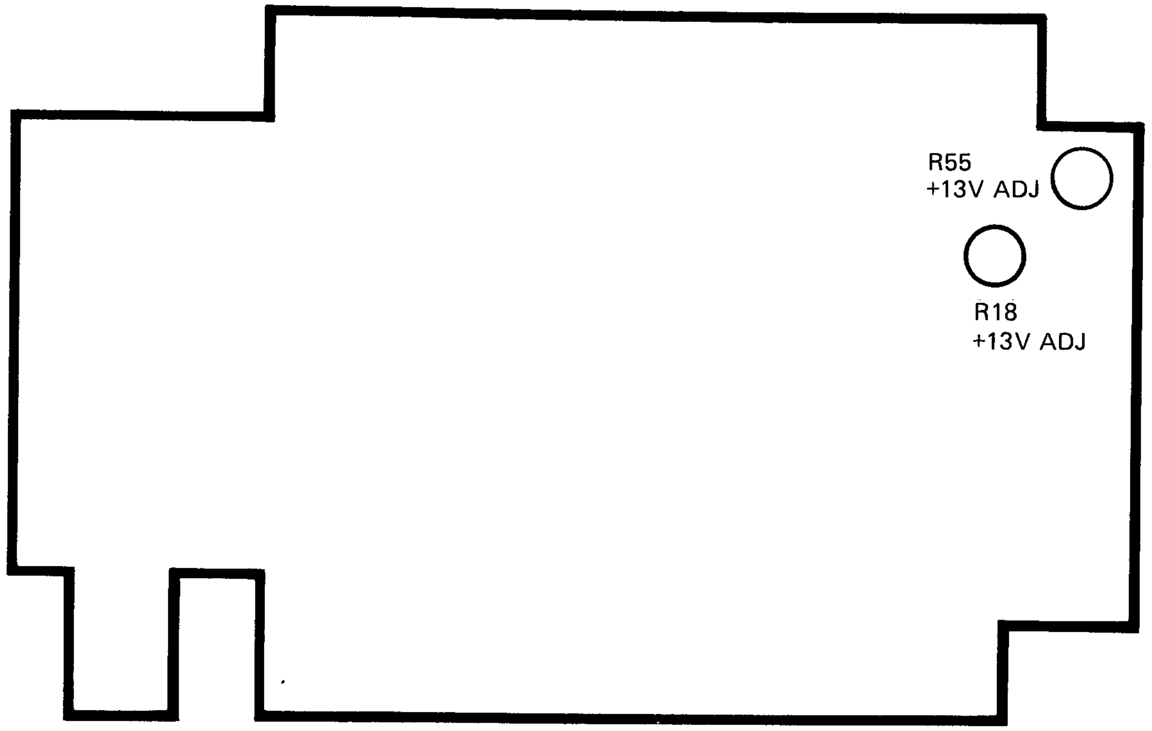
Fig. 3-4-3

LOCATION OF TEST POINTS AND ADJUSTING CONTROLS

AC ADAPTOR/CHAGER WV-PS31

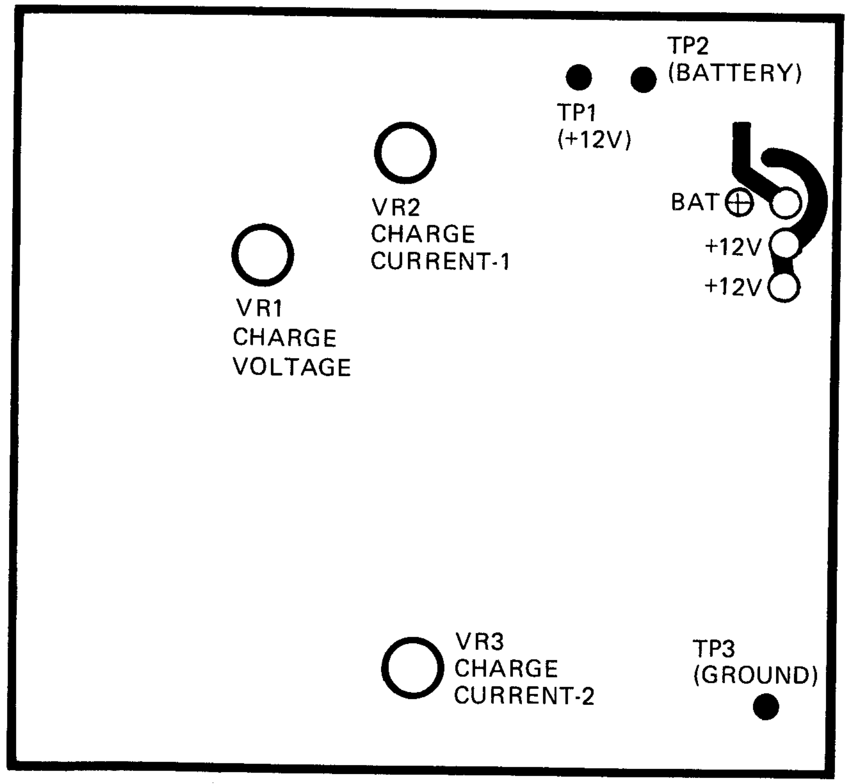
POWER BOARD

—Component Side—


R55
+13V ADJ
R18
+13V ADJ

CONTROL BOARD

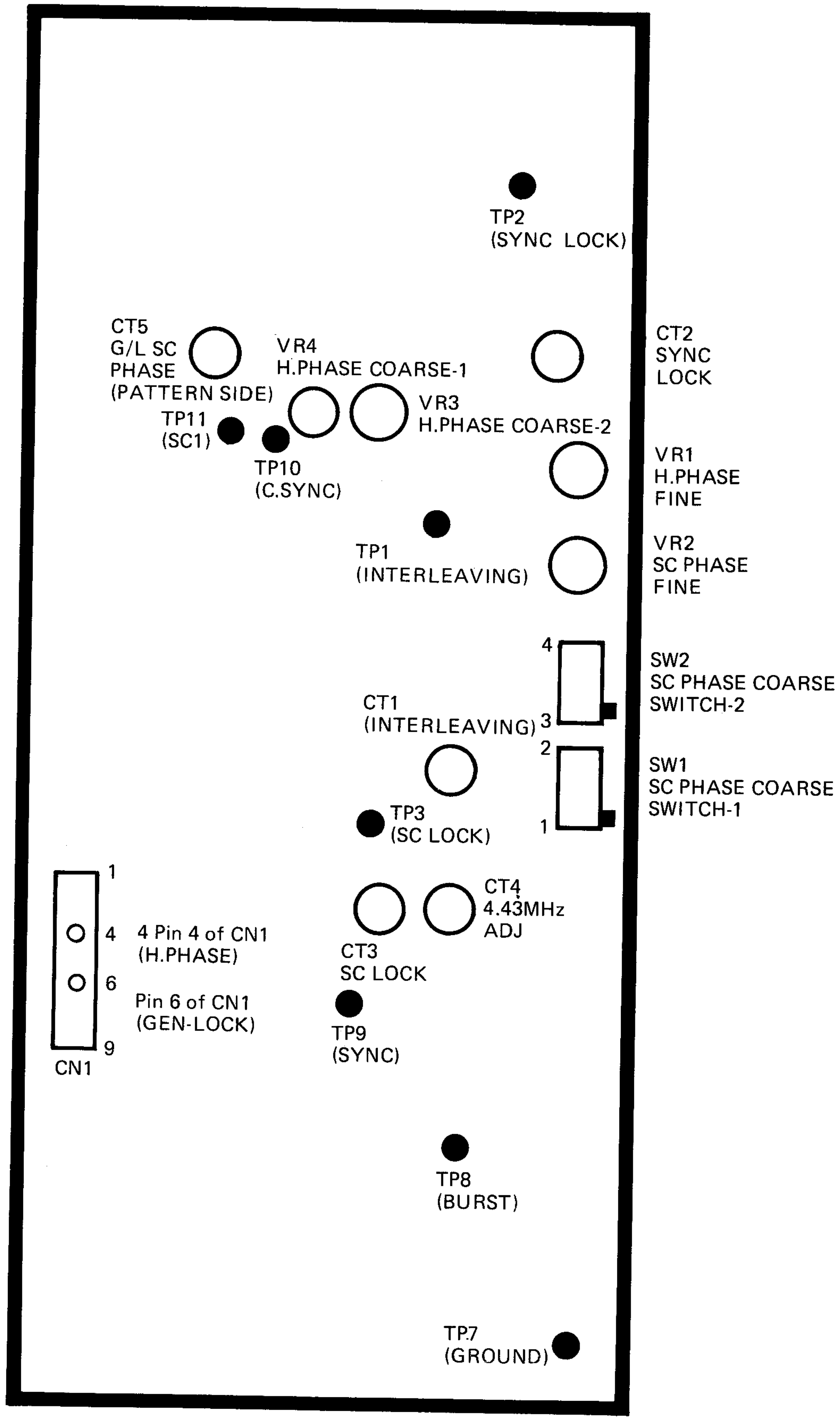
—Conductor Side—


TP2
(BATTERY)
TP1
(+12V)
VR2
CHARGE
CURRENT-1
BAT⊕
+12V
+12V
VR1
CHARGE
VOLTAGE
VR3
CHARGE
CURRENT-2
TP3
(GROUND)

RCU/GEN-LOCK ADAPTOR WV-AD33

GEN-LOCK BOARD

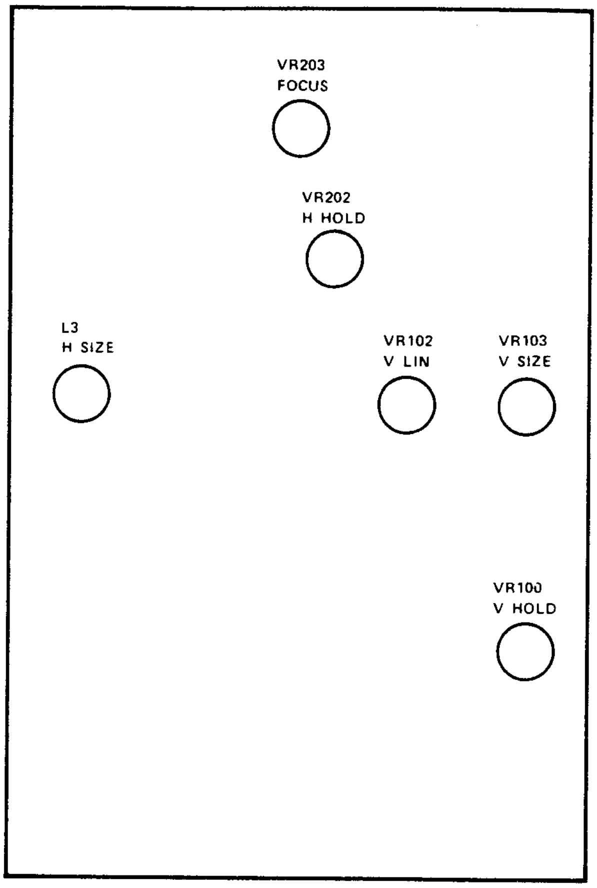
—Component Side—


TP2
(SYNC LOCK)
CT5
G/L SC
PHASE
(PATTERN SIDE)
VR4
H.PHASE COARSE-1
CT2
SYNC
LOCK
TP11
(SC1)
TP10
(C.SYNC)
VR3
H.PHASE COARSE-2
VR1
H.PHASE
FINE
TP1
(INTERLEAVING)
VR2
SC PHASE
FINE
4
3
2
1
SW2
SC PHASE COARSE
SWITCH-2
CT1
(INTERLEAVING)
SW1
SC PHASE COARSE
SWITCH-1
TP3
(SC LOCK)
1
4
6
9
CN1
4 Pin 4 of CN1
(H.PHASE)
Pin 6 of CN1
(GEN-LOCK)
CT4
4.43MHz
ADJ
CT3
SC LOCK
TP9
(SYNC)
TP8
(BURST)
TP7
(GROUND)

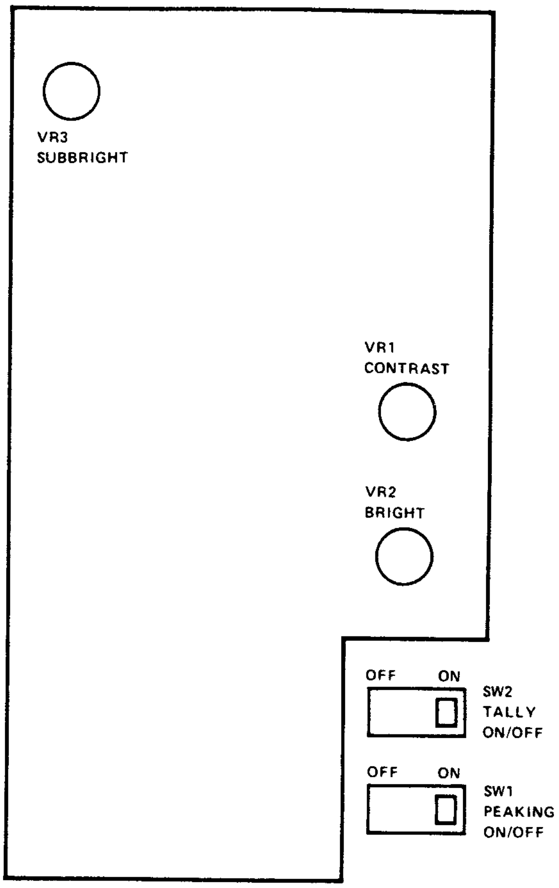
5" VIEWFINDER WV-VF65

—Component Side—

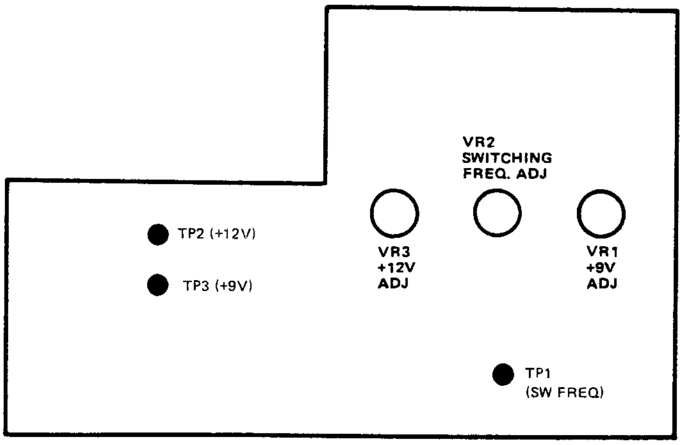
DEFLECTION BOARD


VR203
FOCUS
VR202
H HOLD
L3
H SIZE
VR102
V LIN
VR103
V SIZE
VR100
V HOLD

VIDEO AMPLIFIER BOARD


VR3
SUBBRIGHT
VR1
CONTRAST
VR2
BRIGHT
OFF
ON
SW2
TALLY
ON/OFF
OFF
ON
SW1
PEAKING
ON/OFF

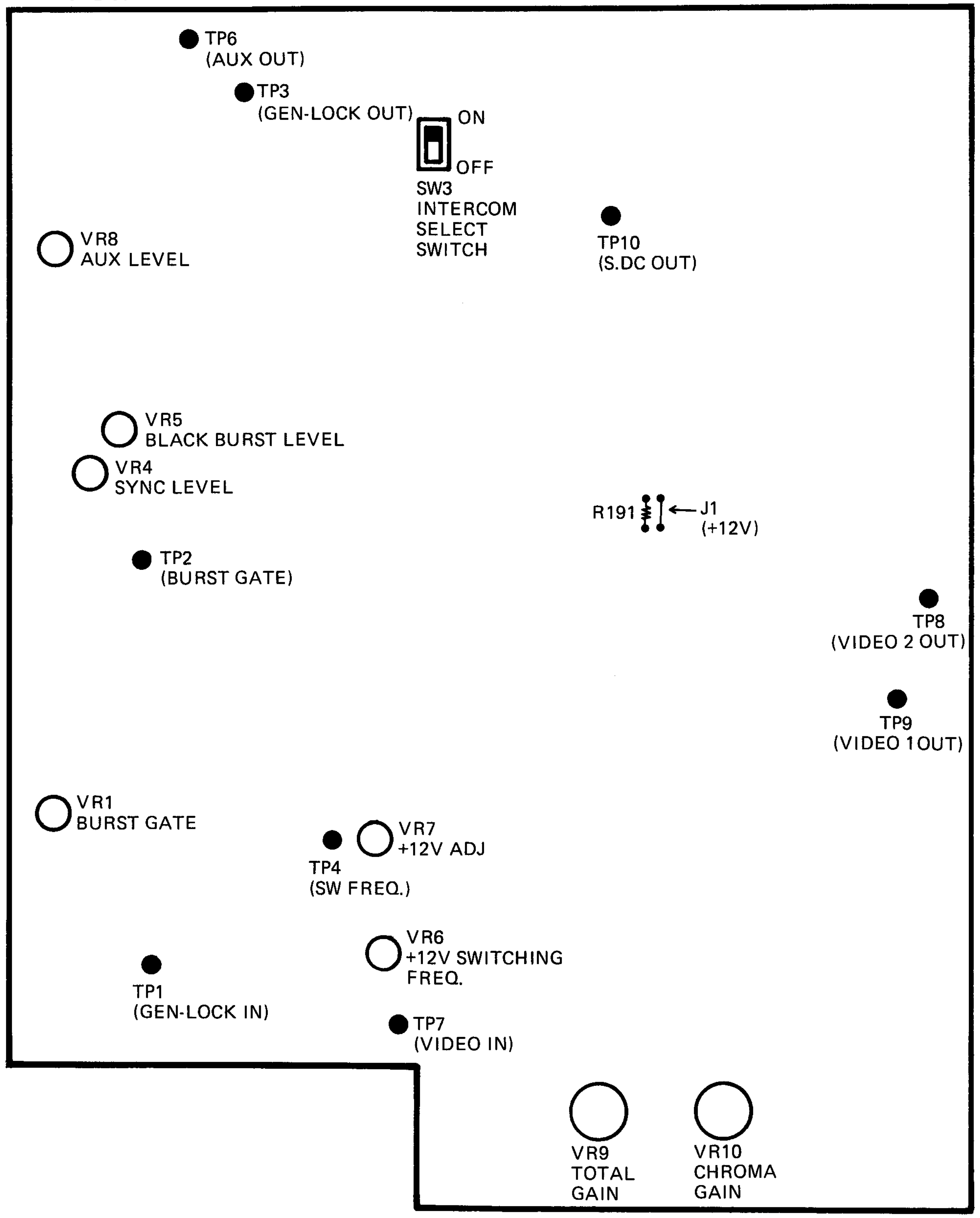
POWER BOARD


VR2
SWITCHING
FREQ. ADJ
TP2 (+12V)
TP3 (+9V)
VR3
+12V
ADJ
VR1
+9V
ADJ
TP1
(SW FREQ)

REMOTE CONTROL UNIT (RCU) WV-RC33

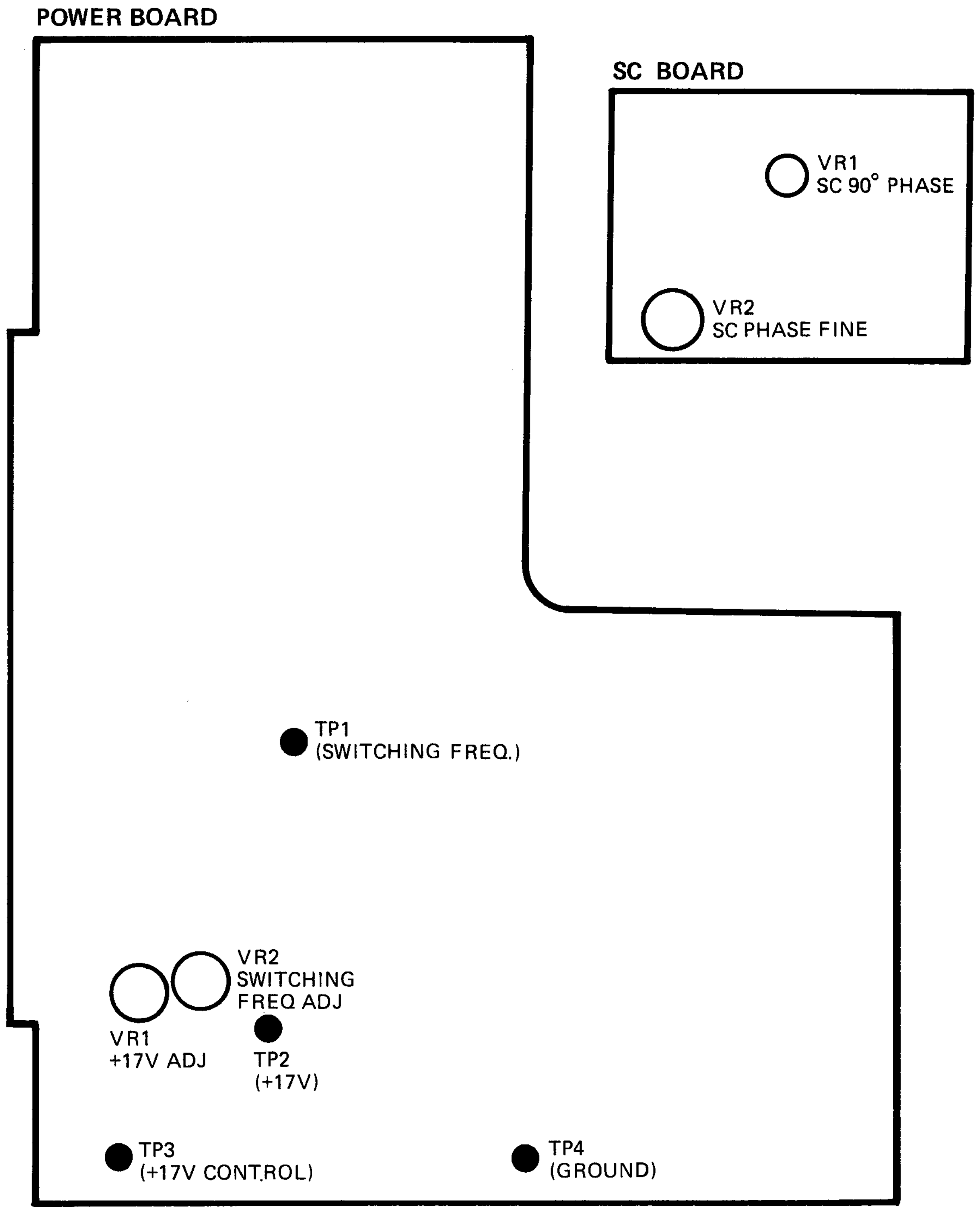
—Component Side—

VIDEO BOARD


TP6
(AUX OUT)
TP3
(GEN-LOCK OUT)
ON
OFF
SW3
INTERCOM
SELECT
SWITCH
TP10
(S.DC OUT)
VR8
AUX LEVEL
VR5
BLACK BURST LEVEL
VR4
SYNC LEVEL
R191
J1
(+12V)
TP2
(BURST GATE)
TP8
(VIDEO 2 OUT)
TP9
(VIDEO 1 OUT)
VR1
BURST GATE
VR7
+12V ADJ
TP4
(SW FREQ.)
VR6
+12V SWITCHING
FREQ.
TP1
(GEN-LOCK IN)
TP7
(VIDEO IN)
VR9
TOTAL
GAIN
VR10
CHROMA
GAIN

REMOTE CONTROL UNIT (RCU) WV-RC33

—Component Side—

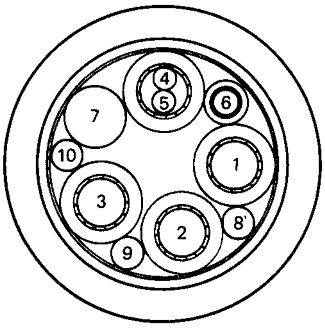

POWER BOARD
SC BOARD
VR1
SC 90° PHASE
VR2
SC PHASE FINE
TP1
(SWITCHING FREQ.)
VR2
SWITCHING
FREQ ADJ
VR1
+17V ADJ
TP2
(+17V)
TP3
(+17V CONTROL)
TP4
(GROUND)

CABLE INFORMATION

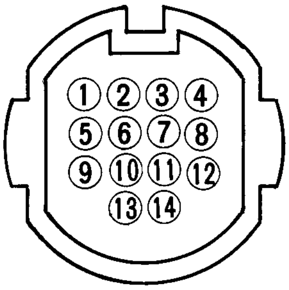
14C-30/14C-100

14 pin Connector Pin No.	Wire No.	Signal	UL No.	Product Description	AWG Size	14 pin Connector Pin No.
1	–	GND	–	SHIELD CABLE	15	1
2	7	GEN-LOCK	UL 1571	*1	18	2
3	4	RCU INCOM/VTR AUDIO	UL 2854	*2	28	3
4	5	INCOM LEVEL	UL 2854	*2	28	4
5	–	GND (Pin No. 3, 4)	UL 1571	*2	20	5
6	1	PAL	UL 1631	COAXIAL CABLE	28	6
7	–	GND (Pin No. 6)	UL 1631		22	7
8	–	GND (Pin No. 9, 11)	UL 1631		18	8
9	2	LINE VIEW/RETURN VIDEO	UL 1631	COAXIAL CABLE	28	9
10	8	RCU IRIS CONT.	UL 1061	*1	28	10
11	3	NOT USED	UL 1631	COAXIAL CABLE	28	11
12	10	RCU SERIAL DATA/ VTR SERIAL CLOCK	UL 1061	*1	28	12
13	9	RCU TOTAL PED	UL 1061	*1	28	13
14	6	RCU H. PHASE	UL 1571	*3	28	14

Note : *1 Tinned copper, vinyl insulated, conductors cabled.
*2 2 Conductors shield cabled.
*3 Tinned copper braid shield cabled.

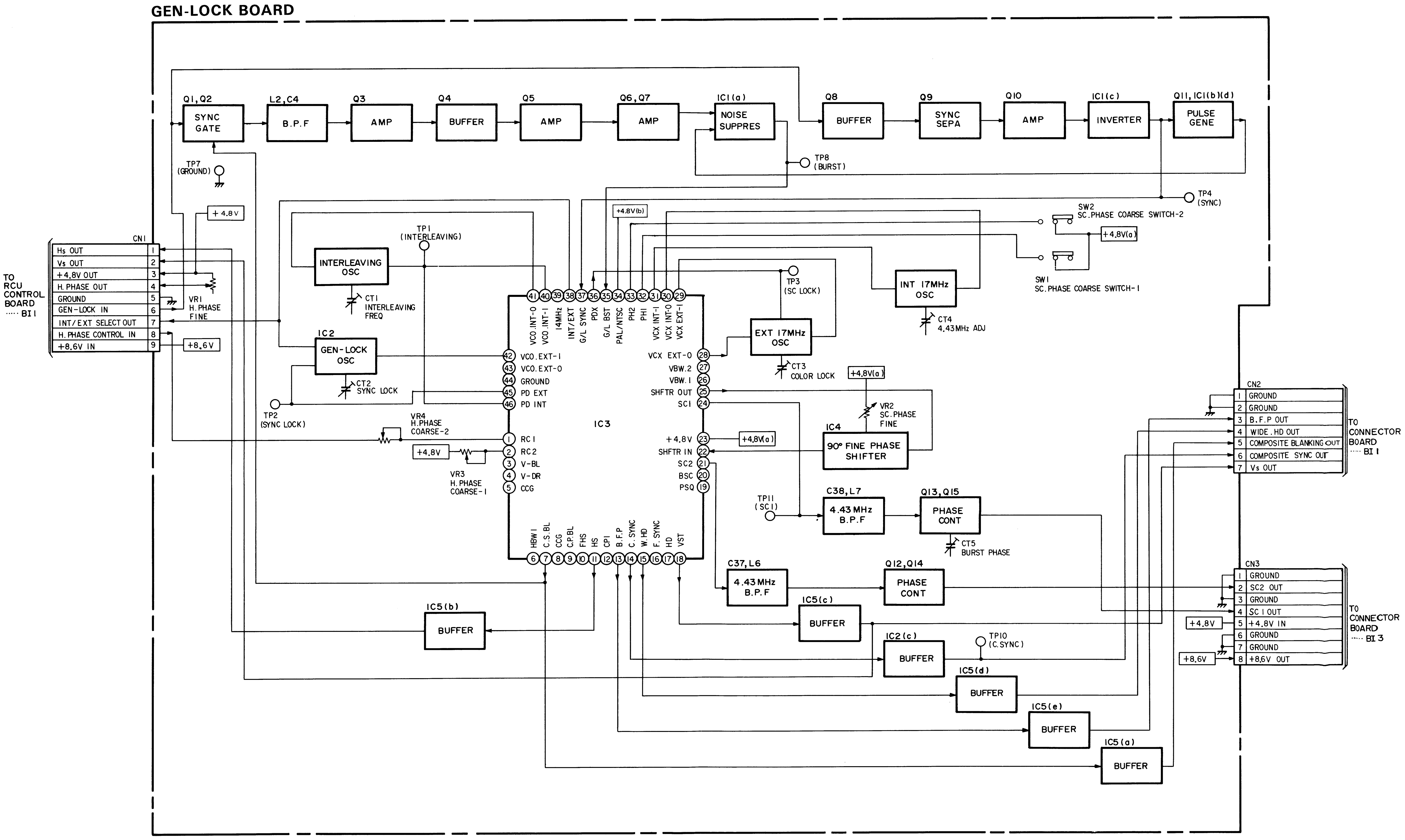


Section of Cable

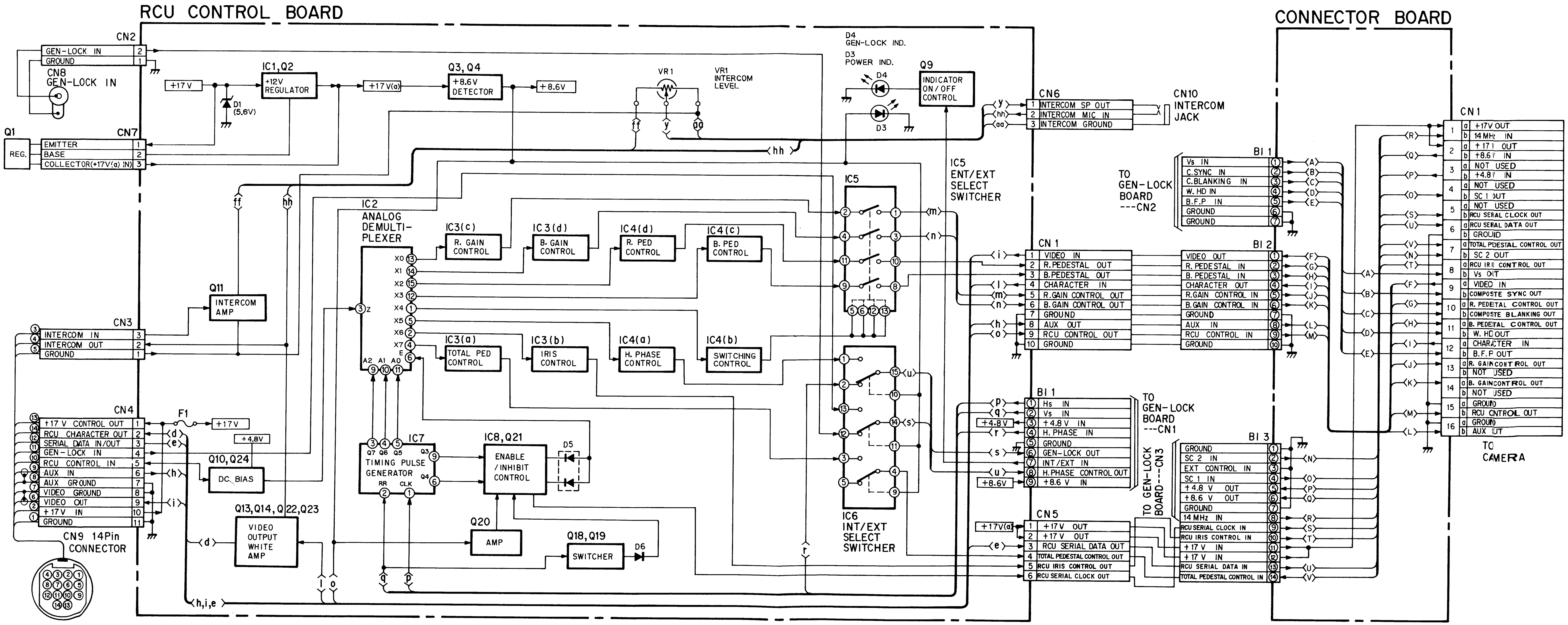


14 Pin Connector

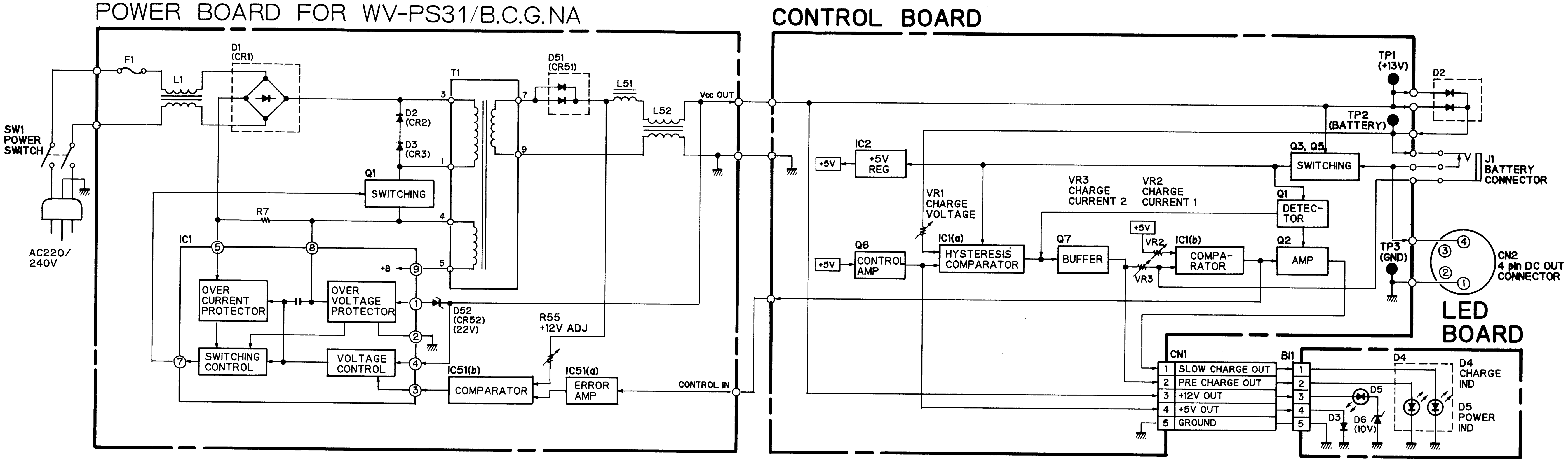
BLOCK DIAGRAM OF GEN-LOCK BOARD (WV-AD33)


GEN-LOCK BOARD
Q1,Q2
SYNC GATE
L2,C4
B.P.F
Q3
AMP
Q4
BUFFER
Q5
AMP
Q6,Q7
AMP
IC1(a)
NOISE SUPPRES
TP8 (BURST)
Q8
BUFFER
Q9
SYNC SEPA
Q10
AMP
IC1(c)
INVERTER
Q11, IC1(b)(d)
PULSE GENE
TP4 (SYNC)
TP7 (GROUND)
+4.8V
+4.8V(b)
SW2
SC.PHASE COARSE SWITCH-2
+4.8V(a)
SW1
SC.PHASE COARSE SWITCH-1
TP1 (INTERLEAVING)
INTERLEAVING OSC
CT1 INTERLEAVING FREQ
INT 17MHz OSC
CT4 4.43MHz ADJ
TP3 (SC LOCK)
EXT 17MHz OSC
CT3 COLOR LOCK
TO RCU CONTROL BOARD ····· BI1
CN1
1 Hs OUT
2 Vs OUT
3 +4.8V OUT
4 H.PHASE OUT
5 GROUND
6 GEN-LOCK IN
7 INT/EXT SELECT OUT
8 H.PHASE CONTROL IN
9 +8.6V IN
VR1 H.PHASE FINE
+8.6V
IC2
GEN-LOCK OSC
CT2 SYNC LOCK
TP2 (SYNC LOCK)
VR4 H.PHASE COARSE-2
+4.8V
VR3 H.PHASE COARSE-1
IC3
41 VCO.INT-0
40 VCO.INT-1
39 14MHz
38 INT/EXT
37 G/L SYNC
36 PDX
35 G/L BST
34 PAL/NTSC
33 PH2
32 PH1
31 VCX INT-1
30 VCX INT-0
29 VCX EXT-1
42 VCO.EXT-1
43 VCO.EXT-0
44 GROUND
45 PD EXT
46 PD INT
1 RC1
2 RC2
3 V-BL
4 V-DR
5 CCG
28 VCX EXT-0
27 VBW.2
26 VBW.1
25 SHFTR OUT
24 SC1
23 +4.8V
22 SHFTR IN
21 SC2
20 BSC
19 PSQ
6 HBW1
7 C.S.BL
8 CCG
9 C.P.BL
10 FHS
11 HS
12 CP1
13 B.F.P
14 C.SYNC
15 W.HD
16 F.SYNC
17 HD
18 VST
+4.8V(a)
+4.8V(a)
VR2 SC.PHASE FINE
IC4
90° FINE PHASE SHIFTER
TP11 (SC1)
C38,L7
4.43MHz B.P.F
Q13,Q15
PHASE CONT
CT5 BURST PHASE
C37,L6
4.43MHz B.P.F
Q12,Q14
PHASE CONT
IC5(b)
BUFFER
IC5(c)
BUFFER
IC2(c)
BUFFER
TP10 (C.SYNC)
IC5(d)
BUFFER
IC5(e)
BUFFER
IC5(a)
BUFFER
CN2
1 GROUND
2 GROUND
3 B.F.P OUT
4 WIDE.HD OUT
5 COMPOSITE BLANKING OUT
6 COMPOSITE SYNC OUT
7 Vs OUT
TO CONNECTOR BOARD ····· BI1
CN3
1 GROUND
2 SC2 OUT
3 GROUND
4 SC1 OUT
5 +4.8V IN
6 GROUND
7 GROUND
8 +8.6V OUT
+4.8V
+8.6V
TO CONNECTOR BOARD ····· BI3

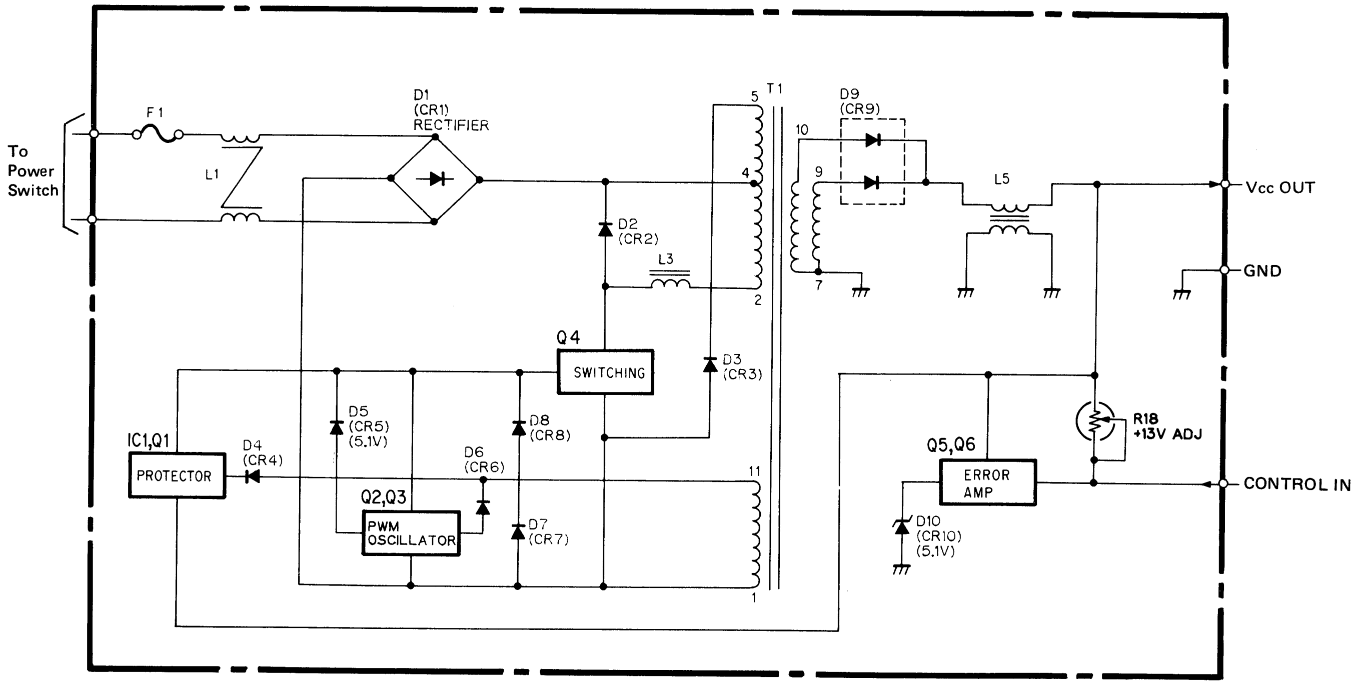
BLOCK DIAGRAM OF RCU CONTROL BOARD, CONNECTOR BOARD

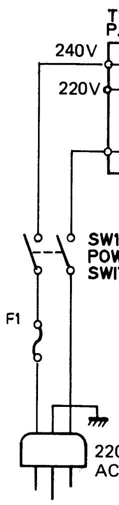

RCU CONTROL BOARD
CONNECTOR BOARD
CN2
GEN-LOCK IN 2
GROUND 1
CN8
GEN-LOCK IN
Q1
REG.
CN7
EMITTER 1
BASE 2
COLLECTOR(+17V(a) IN) 3
+17V
D1 (5.6V)
IC1,Q2
+12V REGULATOR
+17V(a)
Q3,Q4
+8.6V DETECTOR
+8.6V
VR1
VR1 INTERCOM LEVEL
ff
y
aa
hh
D4 GEN-LOCK IND.
D3 POWER IND.
D4
D3
Q9
INDICATOR ON/OFF CONTROL
CN6
1 INTERCOM SP OUT
2 INTERCOM MIC IN
3 INTERCOM GROUND
CN10 INTERCOM JACK
IC2 ANALOG DEMULTI-PLEXER
X0 13
X1 14
X2 15
X3 12
X4 1
X5 5
X6 2
X7 4
Z 3
E 6
A2 A1 A0
9 10 11
IC3(c) R. GAIN CONTROL
IC3(d) B. GAIN CONTROL
IC4(d) R. PED CONTROL
IC4(c) B. PED CONTROL
IC3(a) TOTAL PED CONTROL
IC3(b) IRIS CONTROL
IC4(a) H. PHASE CONTROL
IC4(b) SWITCHING CONTROL
IC5
IC5 ENT/EXT SELECT SWITCHER
IC6 INT/EXT SELECT SWITCHER
m
n
u
s
Q11 INTERCOM AMP
CN3
INTERCOM IN 3
INTERCOM OUT 2
GROUND 1
CN4
+17V CONTROL OUT 1
RCU CHARACTER OUT 2
SERIAL DATA IN/OUT 3
GEN-LOCK IN 4
RCU CONTROL IN 5
AUX IN 6
AUX GROUND 7
VIDEO GROUND 8
VIDEO OUT 9
+17V IN 10
GROUND 11
F1
+17V
+4.8V
d
e
h
i
Q10,Q24 DC BIAS
IC7 TIMING PULSE GENERATOR
Q7 Q6 Q5 Q3 Q4 RR CLK
IC8,Q21 ENABLE /INHIBIT CONTROL
D5
Q13,Q14,Q22,Q23 VIDEO OUTPUT WHITE AMP
Q20 AMP
Q18,Q19 SWITCHER
D6
l o q p r
h,i,e
CN9 14Pin CONNECTOR
CN1
1 VIDEO IN
2 R.PEDESTAL OUT
3 B.PEDESTAL OUT
4 CHARACTER IN
5 R.GAIN CONTROL OUT
6 B.GAIN CONTROL OUT
7 GROUND
8 AUX OUT
9 RCU CONTROL OUT
10 GROUND
BI 1
1 Hs IN
2 Vs IN
3 +4.8V IN
4 H. PHASE IN
5 GROUND
6 GEN-LOCK OUT
7 INT/EXT IN
8 H.PHASE CONTROL OUT
9 +8.6V IN
+4.8V
+8.6V
TO GEN-LOCK BOARD ---CN1
CN5
1 +17V OUT
2 +17V OUT
3 RCU SERIAL DATA OUT
4 TOTAL PEDESTAL CONTROL OUT
5 RCU IRIS CONTROL OUT
6 RCU SERIAL CLOCK OUT
+17V(a)
TO GEN-LOCK BOARD ---CN2
BI 1
Vs IN 1
C.SYNC IN 2
C.BLANKING IN 3
W. HD IN 4
B.F.P IN 5
GROUND 6
GROUND 7
BI 2
VIDEO OUT 1
R. PEDESTAL IN 2
B. PEDESTAL IN 3
CHARACTER OUT 4
R.GAIN CONTROL IN 5
B.GAIN CONTROL IN 6
GROUND 7
AUX IN 8
RCU CONTROL IN 9
GROUND 10
TO GEN-LOCK BOARD---CN3
BI 3
GROUND 1
SC 2 IN 2
EXT CONTROL IN 3
SC 1 IN 4
+4.8 V OUT 5
+8.6 V OUT 6
GROUND 7
14 MHz IN 8
RCU SERIAL CLOCK IN 9
RCU IRIS CONTROL IN 10
+17V IN 11
+17V IN 12
RCU SERIAL DATA IN 13
TOTAL PEDESTAL CONTROL IN 14
A B C D E F G H I J K L M N O P Q R S T U V
CN1
1 a +17V OUT
1 b 14 MHz IN
2 a +17V OUT
2 b +8.6V IN
3 a NOT USED
3 b +4.8V IN
4 a NOT USED
4 b SC 1 OUT
5 a NOT USED
5 b RCU SERIAL CLOCK OUT
6 a RCU SERIAL DATA OUT
6 b GROUND
7 a TOTAL PEDESTAL CONTROL OUT
7 b SC 2 OUT
8 a RCU IRIS CONTROL OUT
8 b Vs OUT
9 a VIDEO IN
9 b COMPOSITE SYNC OUT
10 a R. PEDESTAL CONTROL OUT
10 b COMPOSITE BLANKING OUT
11 a B. PEDESTAL CONTROL OUT
11 b W. HD OUT
12 a CHARACTER IN
12 b B.F.P OUT
13 a R. GAIN CONTROL OUT
13 b NOT USED
14 a B. GAIN CONTROL OUT
14 b NOT USED
15 a GROUND
15 b RCU CONTROL OUT
16 a GROUND
16 b AUX OUT
TO CAMERA

BLOCK DIAGRAM OF POWER BOARD, CONTROL BOARD (WV-PS31)

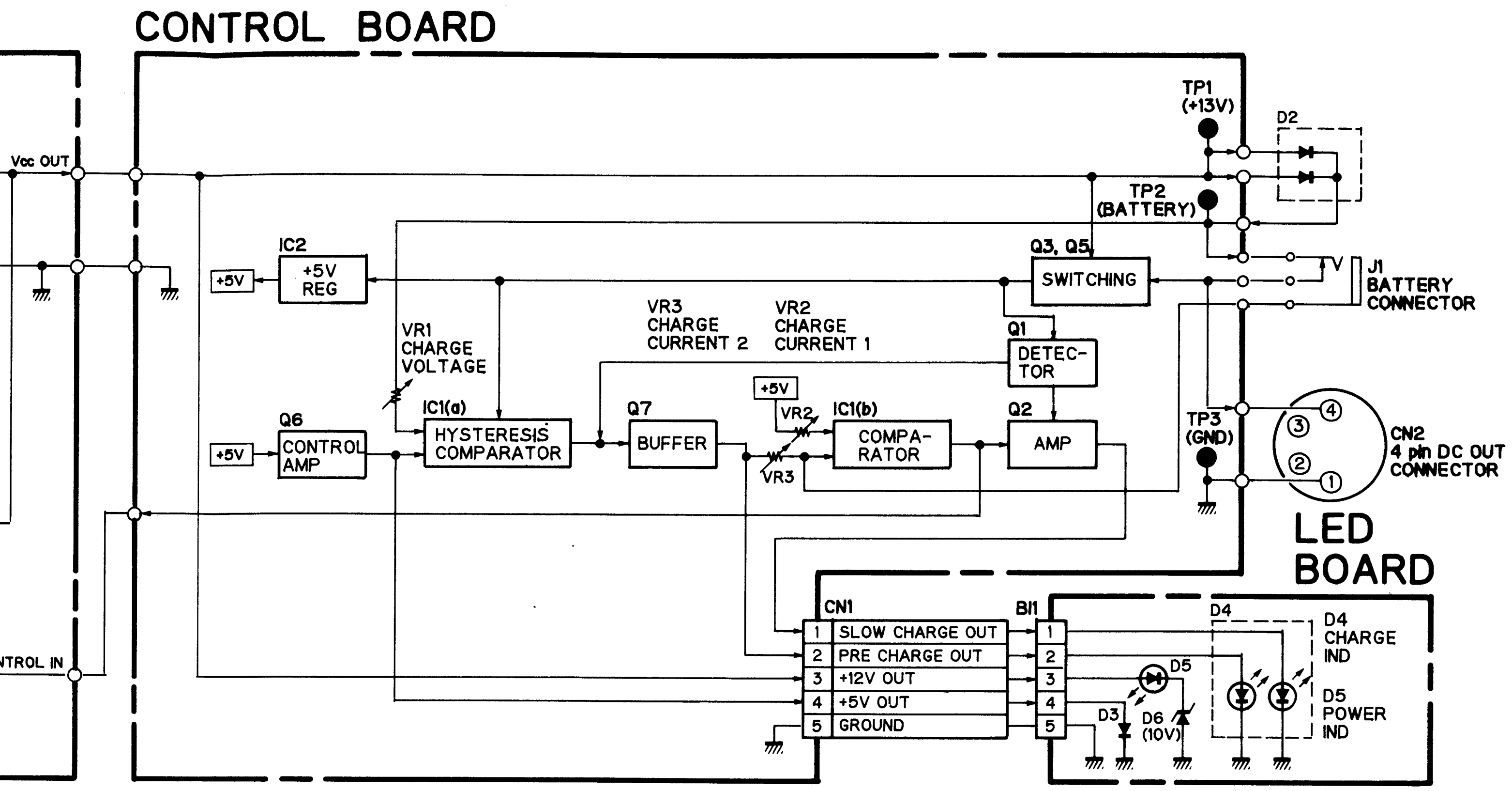

POWER BOARD FOR WV-PS31/B.C.G.NA
CONTROL BOARD
SW1
POWER
SWITCH
AC220/
240V
F1
L1
D1
(CR1)
D2
(CR2)
D3
(CR3)
T1
Q1
SWITCHING
R7
IC1
OVER
CURRENT
PROTECTOR
OVER
VOLTAGE
PROTECTOR
SWITCHING
CONTROL
VOLTAGE
CONTROL
+B
D52
(CR52)
(22V)
R55
+12V ADJ
IC51(b)
COMPARATOR
IC51(a)
ERROR
AMP
CONTROL IN
D51
(CR51)
L51
L52
Vcc OUT
IC2
+5V
REG
+5V
Q6
CONTROL
AMP
VR1
CHARGE
VOLTAGE
IC1(a)
HYSTERESIS
COMPARATOR
VR3
CHARGE
CURRENT 2
VR2
CHARGE
CURRENT 1
Q7
BUFFER
VR2
VR3
IC1(b)
COMPA-
RATOR
Q2
AMP
Q1
DETEC-
TOR
Q3, Q5
SWITCHING
TP1
(+13V)
TP2
(BATTERY)
TP3
(GND)
D2
J1
BATTERY
CONNECTOR
CN2
4 pin DC OUT
CONNECTOR
LED
BOARD
CN1
BI1
1 SLOW CHARGE OUT
2 PRE CHARGE OUT
3 +12V OUT
4 +5V OUT
5 GROUND
D4
CHARGE
IND
D5
POWER
IND
D3
D5
D6
(10V)

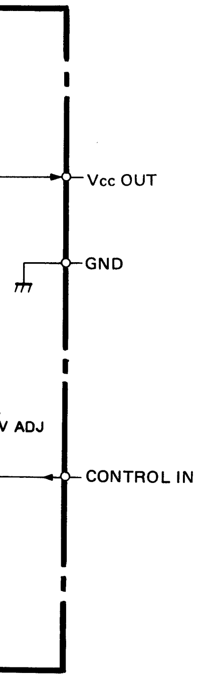
POWER BOARD FOR WV-PS31N


To
Power
Switch
F1
L1
D1
(CR1)
RECTIFIER
T1
D2
(CR2)
L3
Q4
SWITCHING
D3
(CR3)
D9
(CR9)
L5
Vcc OUT
GND
IC1,Q1
PROTECTOR
D4
(CR4)
D5
(CR5)
(5.1V)
D6
(CR6)
D8
(CR8)
D7
(CR7)
Q2,Q3
PWM
OSCILLATOR
Q5,Q6
ERROR
AMP
D10
(CR10)
(5.1V)
R18
+13V ADJ
CONTROL IN

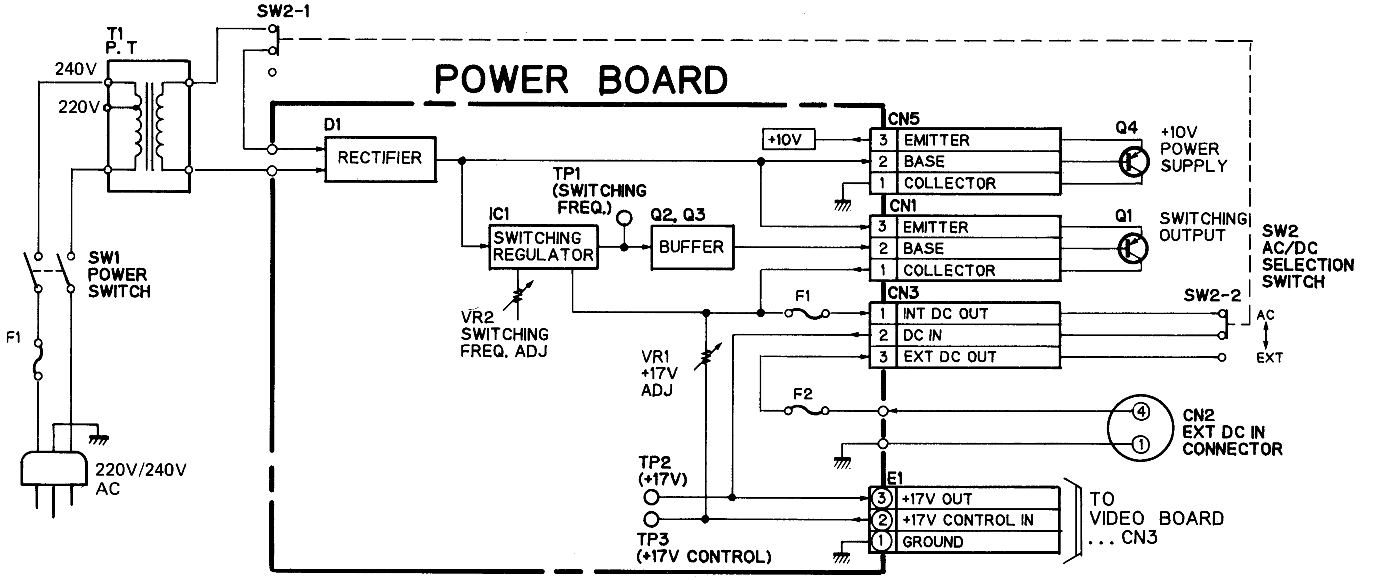

240V
220V
SW1
F1

WER BOARD, CONTROL BOARD (WV-PS31)


CONTROL BOARD
Vcc OUT
TP1 (+13V)
D2
TP2 (BATTERY)
Q3, Q5
SWITCHING
J1 BATTERY CONNECTOR
IC2
+5V
+5V REG
VR1 CHARGE VOLTAGE
VR3 CHARGE CURRENT 2
VR2 CHARGE CURRENT 1
Q1
DETEC-TOR
Q6
+5V
CONTROL AMP
IC1(a)
HYSTERESIS COMPARATOR
Q7
BUFFER
+5V
VR2
IC1(b)
COMPA-RATOR
VR3
Q2
AMP
TP3 (GND)
CN2 4 pin DC OUT CONNECTOR
③ ④ ② ①
LED BOARD
NTROL IN
CN1
1 SLOW CHARGE OUT
2 PRE CHARGE OUT
3 +12V OUT
4 +5V OUT
5 GROUND
BI1
1 2 3 4 5
D4
D5
D3
D6 (10V)
D4 CHARGE IND
D5 POWER IND

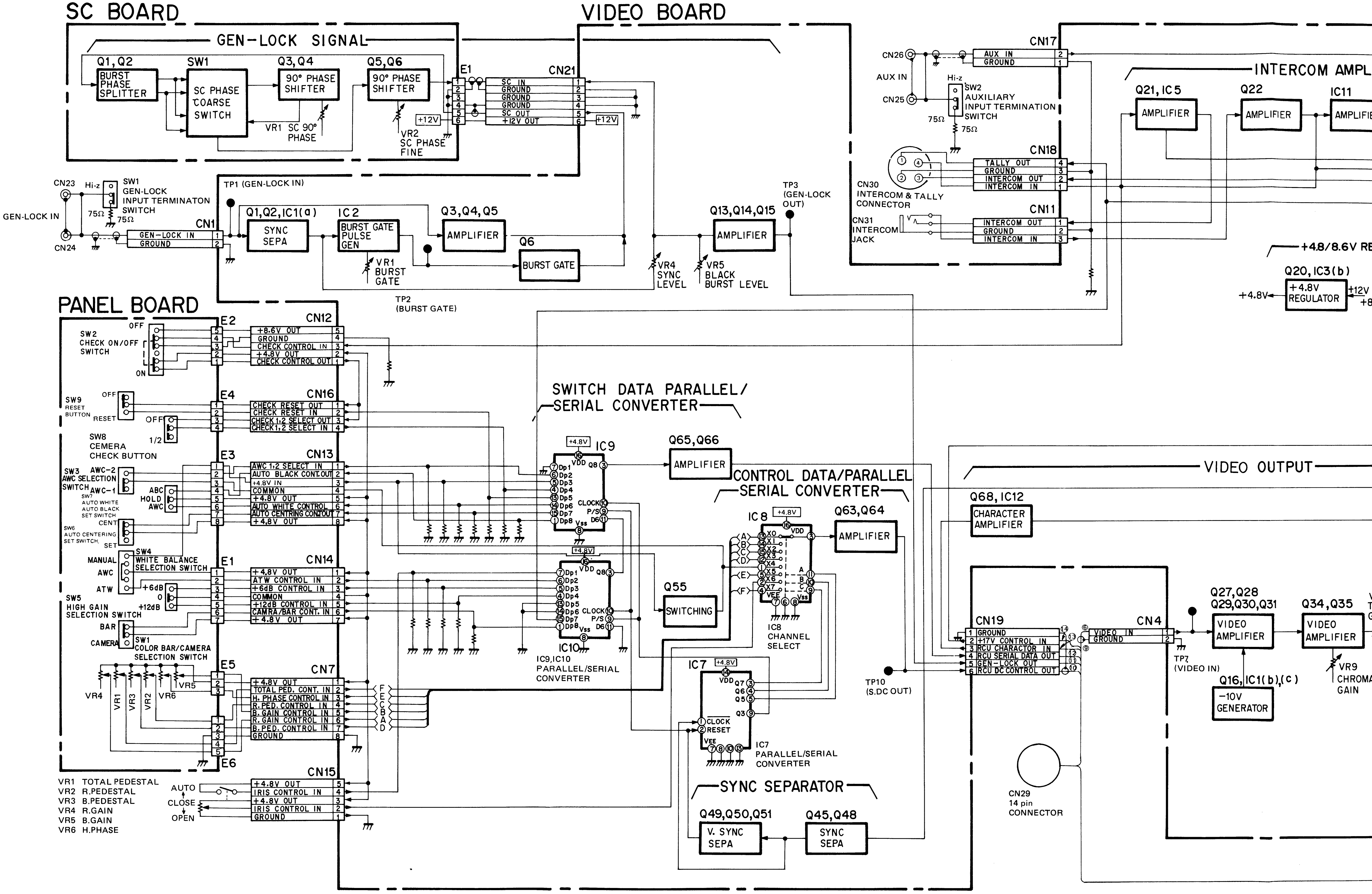

Vcc OUT
GND
V ADJ
CONTROL IN

BLOCK DIAGRAM OF POWER BOARD (WV-RC33)

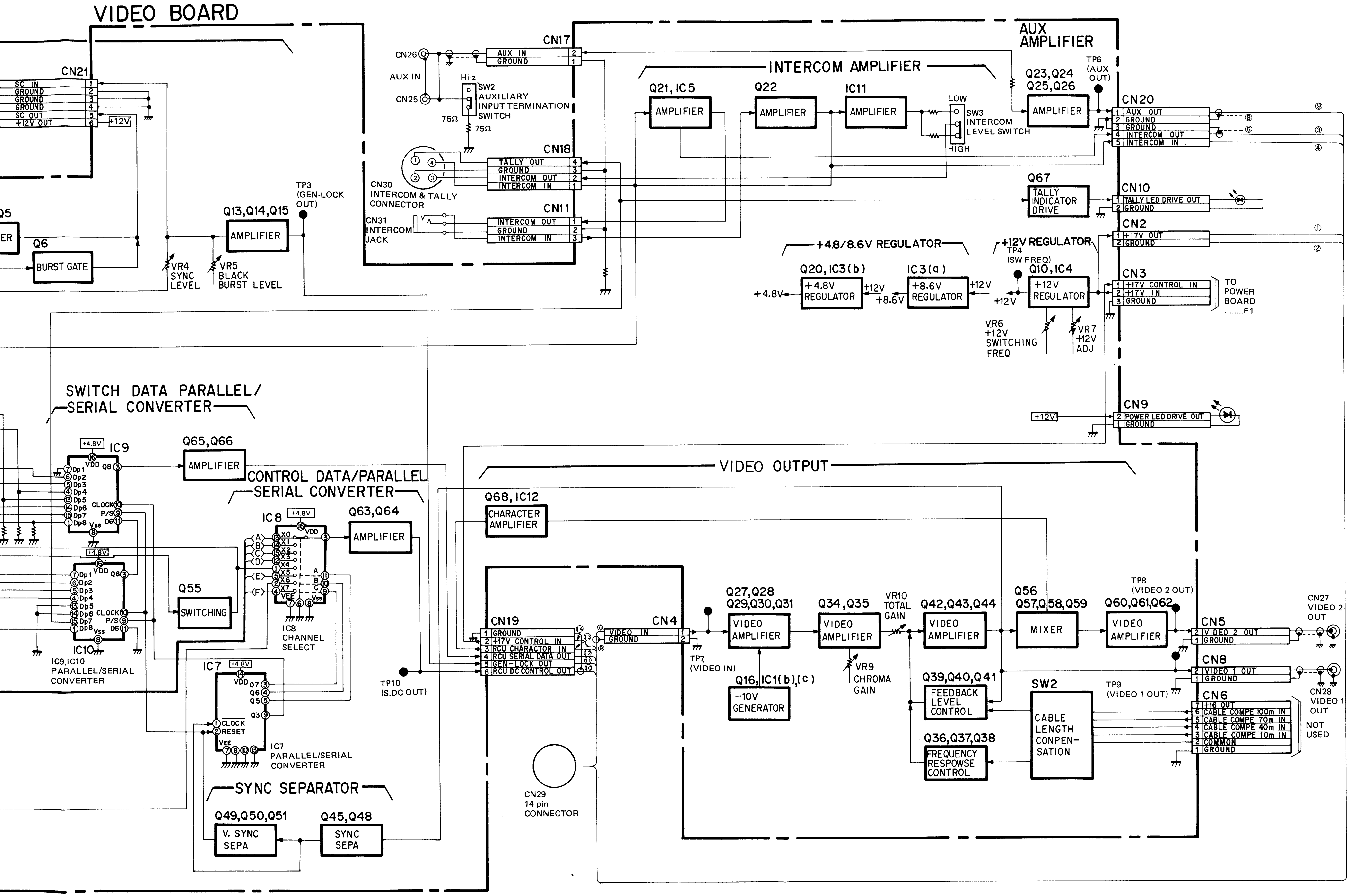

SW2-1
T1 P.T
240V
220V
POWER BOARD
D1
RECTIFIER
TP1 (SWITCHING FREQ.)
IC1
SWITCHING REGULATOR
Q2, Q3
BUFFER
VR2 SWITCHING FREQ. ADJ
+10V
CN5
3 EMITTER
2 BASE
1 COLLECTOR
Q4
+10V POWER SUPPLY
CN1
3 EMITTER
2 BASE
1 COLLECTOR
Q1
SWITCHING OUTPUT
SW2 AC/DC SELECTION SWITCH
SW2-2
AC
EXT
CN3
1 INT DC OUT
2 DC IN
3 EXT DC OUT
F1
F2
VR1 +17V ADJ
CN2 EXT DC IN CONNECTOR
④ ①
SW1 POWER SWITCH
F1
220V/240V AC
TP2 (+17V)
TP3 (+17V CONTROL)
E1
③ +17V OUT
② +17V CONTROL IN
① GROUND
TO VIDEO BOARD ... CN3

RC33/POWER B.

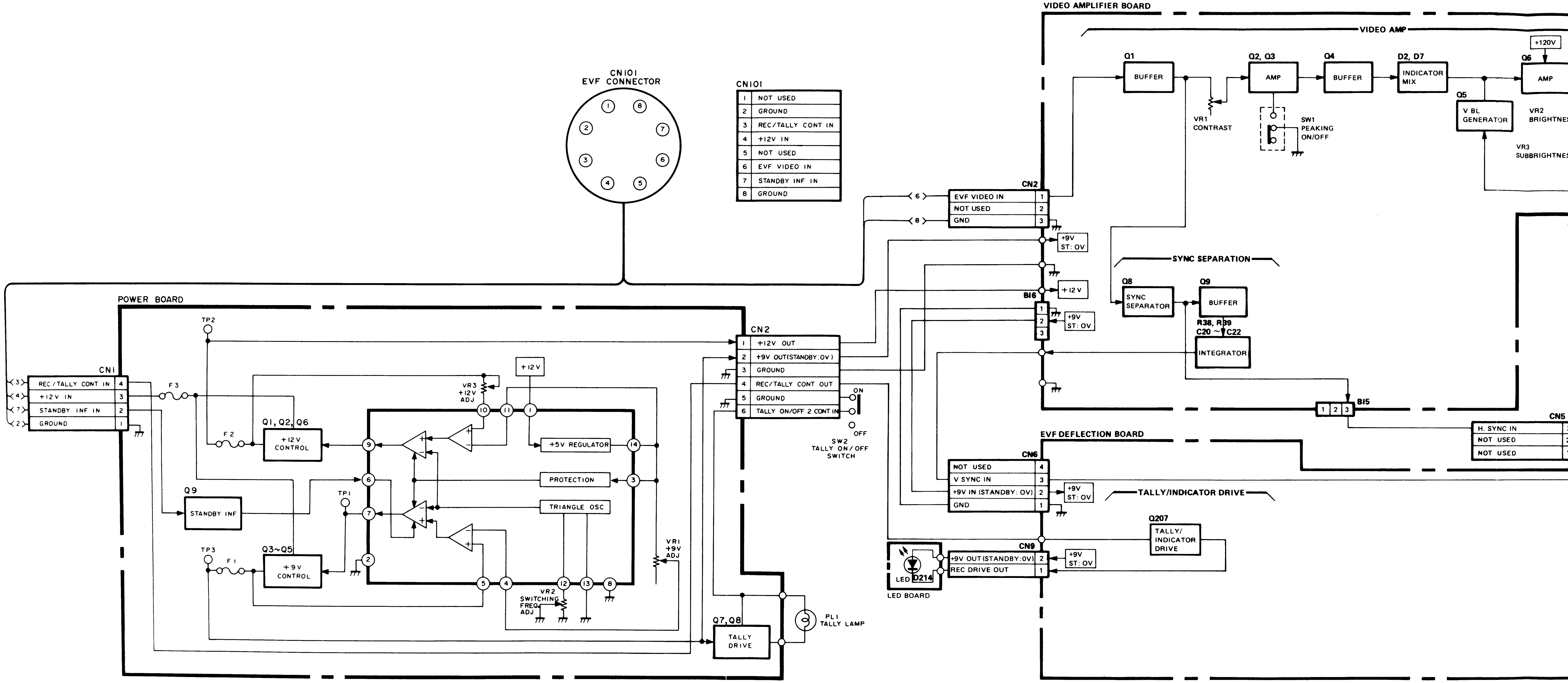
BLOCK DIAGRAM OF VIDEO BOARD, PANEL BOARD, SC BOARD (WV-RC33)


SC BOARD
GEN-LOCK SIGNAL
Q1, Q2
BURST PHASE SPLITTER
SW1
SC PHASE COARSE SWITCH
Q3, Q4
90° PHASE SHIFTER
Q5, Q6
90° PHASE SHIFTER
VR1 SC 90° PHASE
VR2 SC PHASE FINE
+12V
E1
VIDEO BOARD
CN21
SC IN
GROUND
GROUND
GROUND
SC OUT
+12V OUT
CN23
Hi-z
SW1
GEN-LOCK INPUT TERMINATON SWITCH
75Ω
GEN-LOCK IN
CN24
CN1
GEN-LOCK IN
GROUND
TP1 (GEN-LOCK IN)
Q1,Q2,IC1(a)
SYNC SEPA
IC2
BURST GATE PULSE GEN
VR1 BURST GATE
Q3,Q4,Q5
AMPLIFIER
Q6
BURST GATE
TP2 (BURST GATE)
VR4 SYNC LEVEL
VR5 BLACK BURST LEVEL
Q13,Q14,Q15
AMPLIFIER
TP3 (GEN-LOCK OUT)
CN26
AUX IN
CN25
Hi-z
SW2 AUXILIARY INPUT TERMINATION SWITCH
75Ω
CN17
AUX IN
GROUND
CN18
TALLY OUT
GROUND
INTERCOM OUT
INTERCOM IN
CN30 INTERCOM & TALLY CONNECTOR
CN31 INTERCOM JACK
CN11
INTERCOM OUT
GROUND
INTERCOM IN
INTERCOM AMPL
Q21, IC5
AMPLIFIER
Q22
AMPLIFIER
IC11
AMPLIFIE
+4.8/8.6V RE
Q20, IC3(b)
+4.8V REGULATOR
+4.8V
+12V
PANEL BOARD
E2
CN12
SW2 CHECK ON/OFF SWITCH
OFF
ON
+8.6V OUT
GROUND
CHECK CONTROL IN
+4.8V OUT
CHECK CONTROL OUT
E4
CN16
SW9 RESET BUTTON
OFF
RESET
CHECK RESET OUT
CHECK RESET IN
CHECK 1,2 SELECT OUT
CHECK 1,2 SELECT IN
SW8 CAMERA CHECK BUTTON
1/2
E3
CN13
SW3 AWC SELECTION SWITCH
AWC-2
AWC-1
SW7 AUTO WHITE AUTO BLACK SET SWITCH
ABC
HOLD
AWC
SW6 AUTO CENTERING SET SWITCH
CENT
SET
AWC 1,2 SELECT IN
AUTO BLACK CONT.OUT
+4.8V IN
COMMON
+4.8V OUT
AUTO WHITE CONTROL
AUTO CENTRING CONTOUT
+4.8V OUT
SW4 WHITE BALANCE SELECTION SWITCH
MANUAL
AWC
ATW
E1
CN14
SW5 HIGH GAIN SELECTION SWITCH
+6dB
0
+12dB
BAR
CAMERA
SW1 COLOR BAR/CAMERA SELECTION SWITCH
+4.8V OUT
ATW CONTROL IN
+6dB CONTROL IN
COMMON
+12dB CONTROL IN
CAMRA/BAR CONT. IN
+4.8V OUT
E5
CN7
VR4
VR1
VR3
VR2
VR6
VR5
+4.8V OUT
TOTAL PED. CONT. IN
H. PHASE CONTROL IN
R. PED. CONTROL IN
B. GAIN CONTROL IN
R. GAIN CONTROL IN
B. PED. CONTROL IN
GROUND
F E C B A D
E6
CN15
AUTO
CLOSE
OPEN
+4.8V OUT
IRIS CONTROL IN
+4.8V OUT
IRIS CONTROL IN
GROUND
VR1 TOTAL PEDESTAL
VR2 R.PEDESTAL
VR3 B.PEDESTAL
VR4 R.GAIN
VR5 B.GAIN
VR6 H.PHASE
SWITCH DATA PARALLEL/SERIAL CONVERTER
IC9
+4.8V
VDD
Q8
Dp1 Dp2 Dp3 Dp4 Dp5 Dp6 Dp7 Dp8
CLOCK
P/S
D6
Vss
IC10
IC9, IC10 PARALLEL/SERIAL CONVERTER
Q65, Q66
AMPLIFIER
CONTROL DATA/PARALLEL SERIAL CONVERTER
IC8
+4.8V
X0 X1 X2 X3 X4 X5 X6 X7
VEE
Vss
A B C
A B C D E F
IC8 CHANNEL SELECT
Q63, Q64
AMPLIFIER
Q55
SWITCHING
IC7
+4.8V
VDD
Q7 Q6 Q5 Q3
CLOCK
RESET
VEE
IC7 PARALLEL/SERIAL CONVERTER
TP10 (S.DC OUT)
SYNC SEPARATOR
Q49,Q50,Q51
V. SYNC SEPA
Q45,Q48
SYNC SEPA
VIDEO OUTPUT
Q68, IC12
CHARACTER AMPLIFIER
CN19
GROUND
+17V CONTROL IN
RCU CHARACTOR IN
RCU SERIAL DATA OUT
GEN-LOCK OUT
RCU DC CONTROL OUT
CN4
VIDEO IN
GROUND
TP7 (VIDEO IN)
Q27,Q28 Q29,Q30,Q31
VIDEO AMPLIFIER
Q34,Q35
VIDEO AMPLIFIER
VR9 CHROMA GAIN
Q16, IC1(b),(c)
-10V GENERATOR
CN29 14 pin CONNECTOR

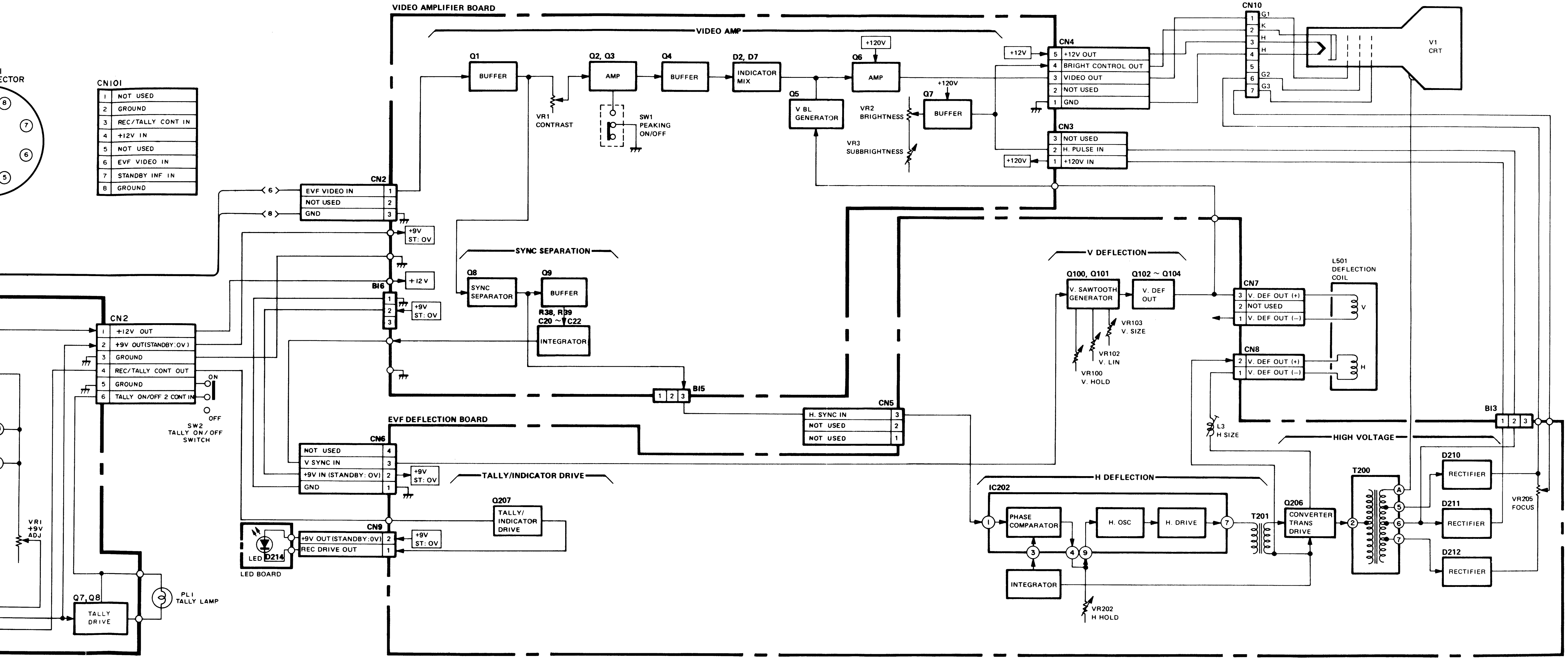
BLOCK DIAGRAM OF VIDEO BOARD, PANEL BOARD, SC BOARD (WV-RC33)


VIDEO BOARD
CN21
SC IN
GROUND
GROUND
GROUND
SC OUT
+12V OUT
+12V
Q5
ER
Q6
BURST GATE
VR4 SYNC LEVEL
VR5 BLACK BURST LEVEL
Q13,Q14,Q15
AMPLIFIER
TP3 (GEN-LOCK OUT)
CN26
AUX IN
CN25
Hi-z
SW2 AUXILIARY INPUT TERMINATION SWITCH
75Ω
CN17
AUX IN
GROUND
CN18
TALLY OUT
GROUND
INTERCOM OUT
INTERCOM IN
CN30 INTERCOM & TALLY CONNECTOR
CN31 INTERCOM JACK
CN11
INTERCOM OUT
GROUND
INTERCOM IN
INTERCOM AMPLIFIER
Q21, IC5
AMPLIFIER
Q22
AMPLIFIER
IC11
AMPLIFIER
LOW
HIGH
SW3 INTERCOM LEVEL SWITCH
AUX AMPLIFIER
Q23,Q24 Q25,Q26
AMPLIFIER
TP6 (AUX OUT)
CN20
AUX OUT
GROUND
GROUND
INTERCOM OUT
INTERCOM IN
⑨
⑧
⑤
③
④
Q67
TALLY INDICATOR DRIVE
CN10
TALLY LED DRIVE OUT
GROUND
CN2
+17V OUT
GROUND
①
②
+4.8/8.6V REGULATOR
+12V REGULATOR
TP4 (SW FREQ)
Q20, IC3(b)
+4.8V REGULATOR
+4.8V
+12V
+8.6V
IC3(a)
+8.6V REGULATOR
+12V
Q10, IC4
+12V REGULATOR
VR6 +12V SWITCHING FREQ
VR7 +12V ADJ
CN3
+17V CONTROL IN
+17V IN
GROUND
TO POWER BOARD E1
CN9
+12V
POWER LED DRIVE OUT
GROUND
SWITCH DATA PARALLEL/ SERIAL CONVERTER
+4.8V
IC9
VDD
Dp1
Dp2
Dp3
Dp4
Dp5
Dp6
Dp7
Dp8
Q8
CLOCK
P/S
D6
Vss
Q65,Q66
AMPLIFIER
CONTROL DATA/PARALLEL SERIAL CONVERTER
IC8
+4.8V
X0 X1 X2 X3 X4 X5 X6 X7
VEE
Vss
A B C
(A) (B) (C) (D) (E) (F)
IC8 CHANNEL SELECT
Q63,Q64
AMPLIFIER
IC10
IC9,IC10 PARALLEL/SERIAL CONVERTER
Q55
SWITCHING
IC7
+4.8V
VDD
Q7 Q6 Q5 Q3
CLOCK
RESET
VEE
IC7 PARALLEL/SERIAL CONVERTER
TP10 (S.DC OUT)
SYNC SEPARATOR
Q49,Q50,Q51
V. SYNC SEPA
Q45,Q48
SYNC SEPA
VIDEO OUTPUT
Q68, IC12
CHARACTER AMPLIFIER
CN19
GROUND
+17V CONTROL IN
RCU CHARACTOR IN
RCU SERIAL DATA OUT
GEN-LOCK OUT
RCU DC CONTROL OUT
CN4
VIDEO IN
GROUND
TP7 (VIDEO IN)
CN29 14 pin CONNECTOR
Q27,Q28 Q29,Q30,Q31
VIDEO AMPLIFIER
Q16, IC1(b),(c)
-10V GENERATOR
Q34,Q35
VIDEO AMPLIFIER
VR9 CHROMA GAIN
VR10 TOTAL GAIN
Q42,Q43,Q44
VIDEO AMPLIFIER
Q39,Q40,Q41
FEEDBACK LEVEL CONTROL
Q36,Q37,Q38
FREQUENCY RESPOWSE CONTROL
Q56 Q57,Q58,Q59
MIXER
SW2
CABLE LENGTH CONPEN-SATION
TP8 (VIDEO 2 OUT)
Q60,Q61,Q62
VIDEO AMPLIFIER
TP9 (VIDEO 1 OUT)
CN5
VIDEO 2 OUT
GROUND
CN27 VIDEO 2 OUT
CN8
VIDEO 1 OUT
GROUND
CN28 VIDEO 1 OUT
CN6
+16 OUT
CABLE COMPE 100m IN
CABLE COMPE 70m IN
CABLE COMPE 40m IN
CABLE COMPE 10m IN
COMMON
GROUND
NOT USED

BLOCK DIAGRAM OF 5″ VIEWFINDER FOR WV-VF65


CN101
EVF CONNECTOR
CN101
1 NOT USED
2 GROUND
3 REC/TALLY CONT IN
4 +12V IN
5 NOT USED
6 EVF VIDEO IN
7 STANDBY INF IN
8 GROUND
POWER BOARD
CN1
REC/TALLY CONT IN 4
+12V IN 3
STANDBY INF IN 2
GROUND 1
TP2
F3
F2
Q1, Q2, Q6
+12V CONTROL
Q9
STANDBY INF
TP1
TP3
F1
Q3~Q5
+9V CONTROL
VR3 +12V ADJ
+12V
+5V REGULATOR
PROTECTION
TRIANGLE OSC
VR2 SWITCHING FREQ. ADJ
VR1 +9V ADJ
Q7, Q8
TALLY DRIVE
PL1 TALLY LAMP
CN2
1 +12V OUT
2 +9V OUT(STANDBY:OV)
3 GROUND
4 REC/TALLY CONT OUT
5 GROUND
6 TALLY ON/OFF 2 CONT IN
ON
OFF
SW2 TALLY ON/OFF SWITCH
VIDEO AMPLIFIER BOARD
VIDEO AMP
CN2
EVF VIDEO IN 1
NOT USED 2
GND 3
+9V ST: OV
+12V
B16
Q1 BUFFER
VR1 CONTRAST
Q2, Q3 AMP
SW1 PEAKING ON/OFF
Q4 BUFFER
D2, D7 INDICATOR MIX
+120V
Q6 AMP
Q5 V BL GENERATOR
VR2 BRIGHTNES
VR3 SUBBRIGHTNES
SYNC SEPARATION
Q8 SYNC SEPARATOR
Q9 BUFFER
R38, R39
C20 ~ C22
INTEGRATOR
B15
EVF DEFLECTION BOARD
CN6
NOT USED 4
V SYNC IN 3
+9V IN (STANDBY: OV) 2
GND 1
TALLY/INDICATOR DRIVE
Q207 TALLY/INDICATOR DRIVE
CN9
+9V OUT(STANDBY:OV) 2
REC DRIVE OUT 1
LED D214
LED BOARD
CN5
H. SYNC IN
NOT USED
NOT USED

BLOCK DIAGRAM OF 5″ VIEWFINDER FOR WV-VF65



ECTOR
CN101
1 NOT USED
2 GROUND
3 REC/TALLY CONT IN
4 +12V IN
5 NOT USED
6 EVF VIDEO IN
7 STANDBY INF IN
8 GROUND
VIDEO AMPLIFIER BOARD
VIDEO AMP
CN2
EVF VIDEO IN 1
NOT USED 2
GND 3
+9V ST: OV
+12V
BI6
Q1 BUFFER
Q2, Q3 AMP
Q4 BUFFER
D2, D7 INDICATOR MIX
Q6 AMP
+120V
Q5 V BL GENERATOR
VR2 BRIGHTNESS
Q7 BUFFER
VR3 SUBBRIGHTNESS
VR1 CONTRAST
SW1 PEAKING ON/OFF
SYNC SEPARATION
Q8 SYNC SEPARATOR
Q9 BUFFER
R38, R39 C20 ~ C22
INTEGRATOR
BI5
CN4
5 +12V OUT
4 BRIGHT CONTROL OUT
3 VIDEO OUT
2 NOT USED
1 GND
+12V
CN3
3 NOT USED
2 H. PULSE IN
1 +120V IN
+120V
CN10
G1 K H H G2 G3
V1 CRT
CN2
1 +12V OUT
2 +9V OUT(STANDBY:OV)
3 GROUND
4 REC/TALLY CONT OUT
5 GROUND
6 TALLY ON/OFF 2 CONT IN
ON
OFF
SW2 TALLY ON/OFF SWITCH
VR1 +9V ADJ
Q7,Q8 TALLY DRIVE
PL1 TALLY LAMP
EVF DEFLECTION BOARD
CN6
NOT USED 4
V SYNC IN 3
+9V IN (STANDBY: OV) 2
GND 1
TALLY/INDICATOR DRIVE
Q207 TALLY/INDICATOR DRIVE
CN9
+9V OUT (STANDBY:OV) 2
REC DRIVE OUT 1
LED D214
LED BOARD
CN5
H. SYNC IN 3
NOT USED 2
NOT USED 1
V DEFLECTION
Q100, Q101 V. SAWTOOTH GENERATOR
Q102 ~ Q104 V. DEF OUT
VR103 V. SIZE
VR102 V. LIN
VR100 V. HOLD
CN7
3 V. DEF OUT (+)
2 NOT USED
1 V. DEF OUT (−)
CN8
2 V. DEF OUT (+)
1 V. DEF OUT (−)
L501 DEFLECTION COIL
V
H
L3 H SIZE
BI3
HIGH VOLTAGE
H DEFLECTION
IC202
PHASE COMPARATOR
H. OSC
H. DRIVE
INTEGRATOR
VR202 H HOLD
T201
Q206 CONVERTER TRANS DRIVE
T200
D210 RECTIFIER
D211 RECTIFIER
D212 RECTIFIER
VR205 FOCUS

CONDUCTOR VIEW OF POWER BOARD, CONTROL BOARD (WV-PS31)

Power Board For WV-PS31/B.C.G.NA

IC1	AC037	D2,D3
IC51	UPC358C	D3
Q1	2SK538 or 2SK415	C2
D1	1J4B41	D2
D2	ERB44-08 or SM-1AH-10	D2
D3	ERB44-08 or SM-1AH-10	C2
D51	ESAB85-009	C3
D52	RD22EB	C3
D53	1SS118 or 15954 or MA171	C3
D54	1SS118 or 1S954 or MA171	C3
D55	RD5.1JSB	C3
D56	RD4.3EB	D3
D57	RD8.2EB	C3

Power Board For WV-PS31N

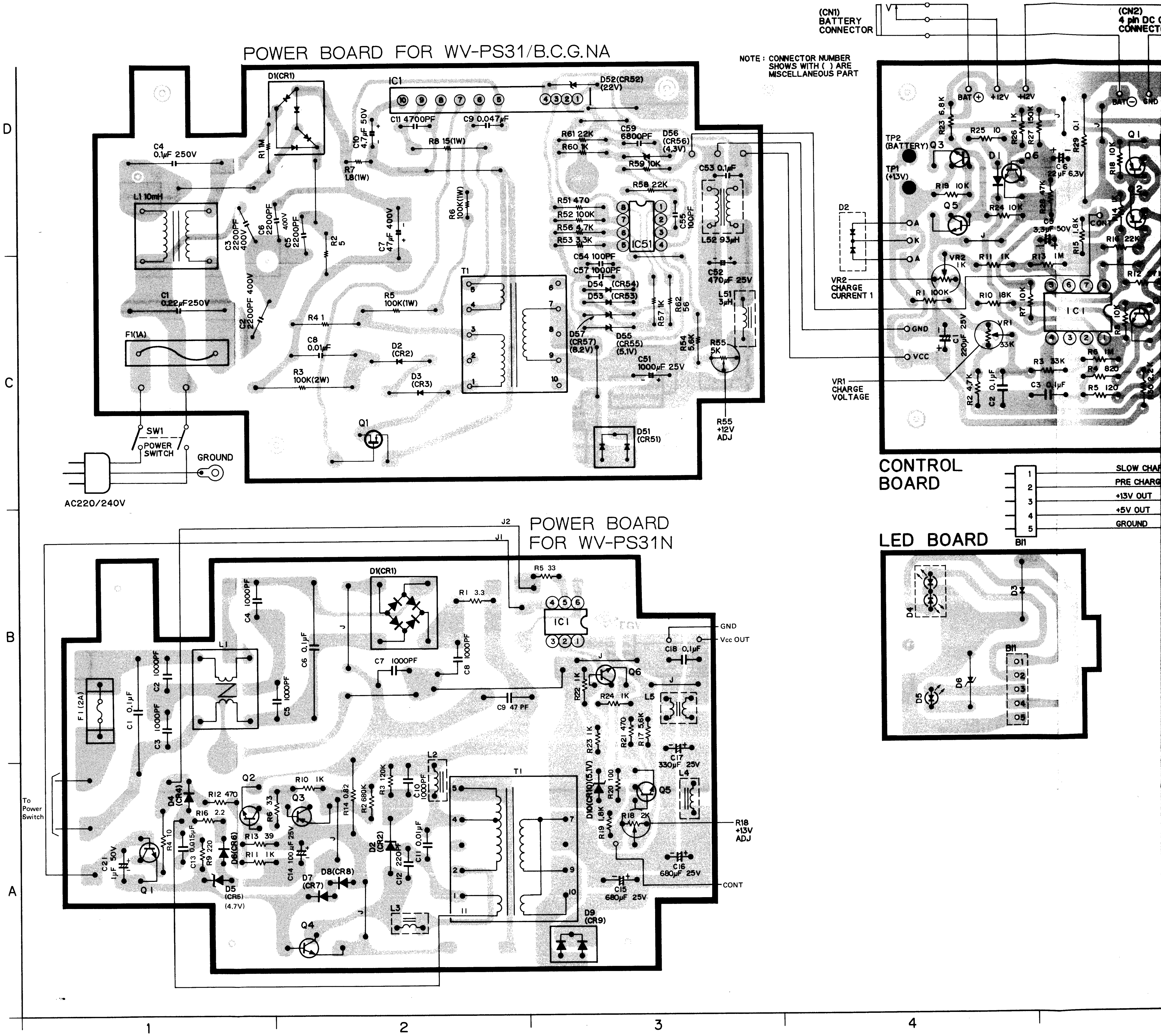
IC1	TLP531GR	B3
Q1	2SC2655Y	A1
Q2	2SC945Q or 2SC945P	A1
Q3	2SA1020Y	A2
Q4	2SC2792	A2
Q5	2SC945Q or 2SC945P	A3
Q6	2SC945Q or 2SC945P	B3
D1	KBPC606	B2
D2	RGP10K	A2
D4	1SS118 or 1S954	A1
D5	RD4.7EB2	A1
D6	1SS118 or 1S954	A1
D7	1SS118 or 1S954	A2
D8	RD4.7EB2	A2
D9	ESAB82-004	A3
D10	RD5.1EBZ	A3

LED Board

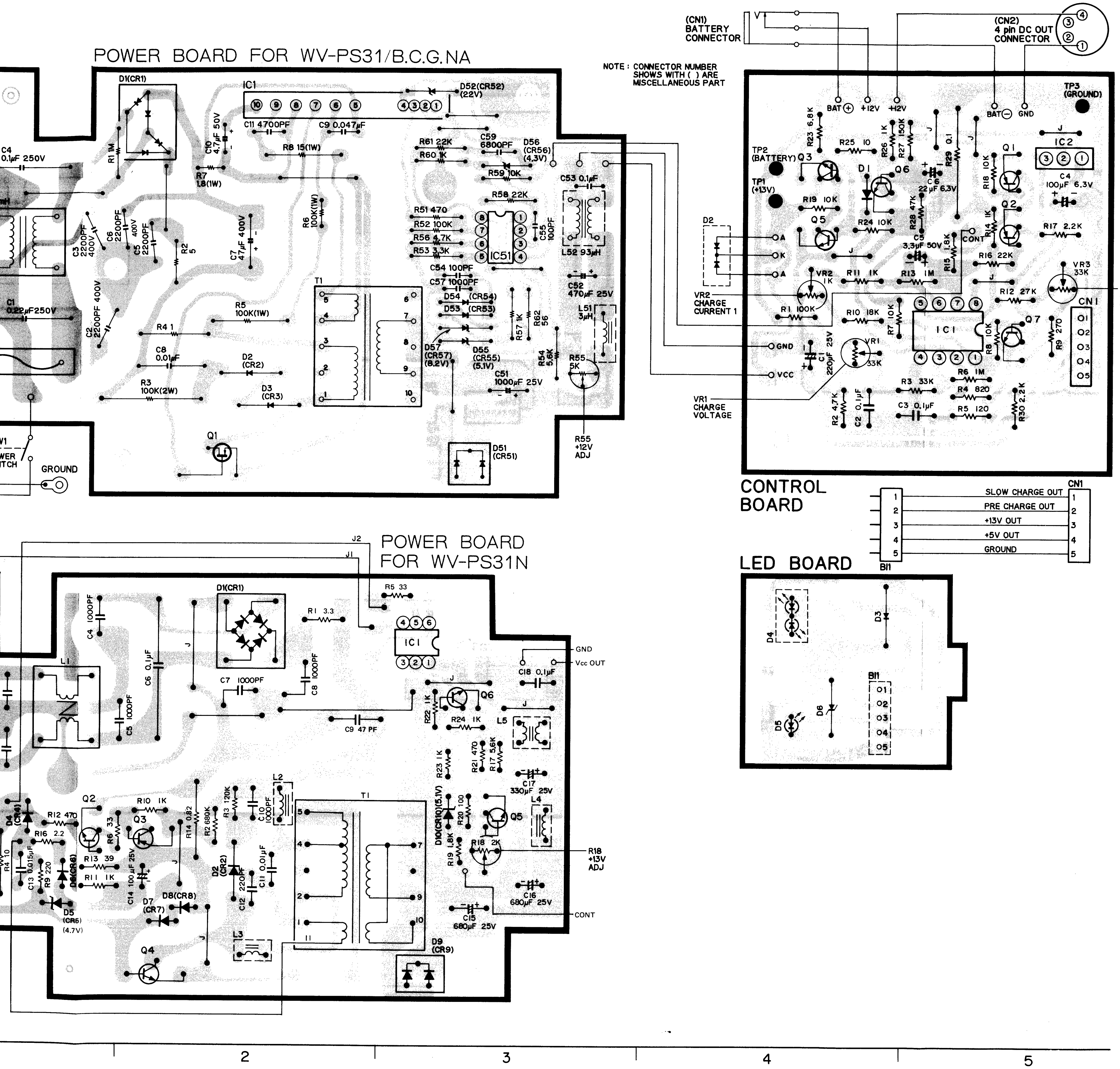
D3	MA27TA	B4
D4	LN11WP23	B4
D5	LN21RPHL	B4
D6	MA4100L	B4

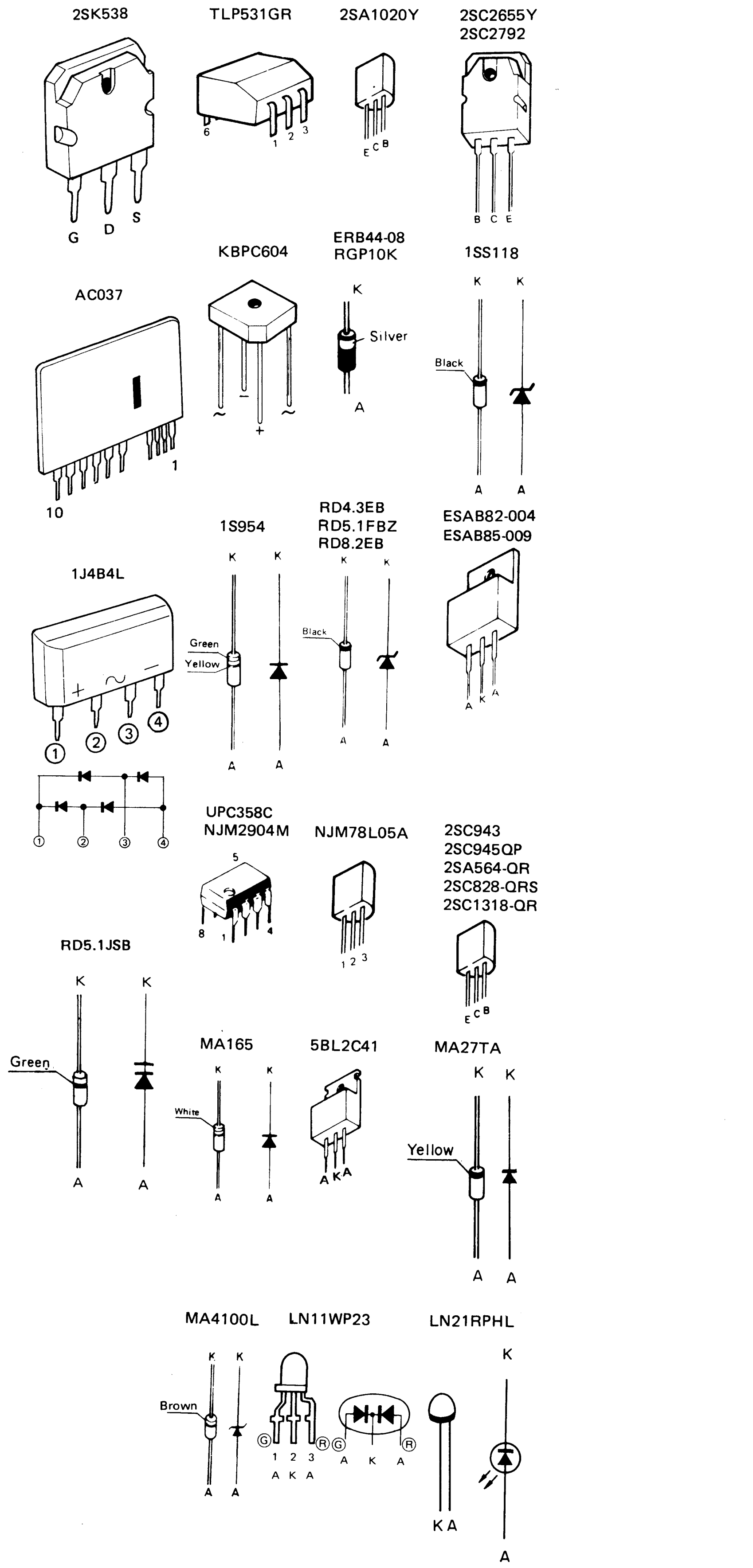
Control Board

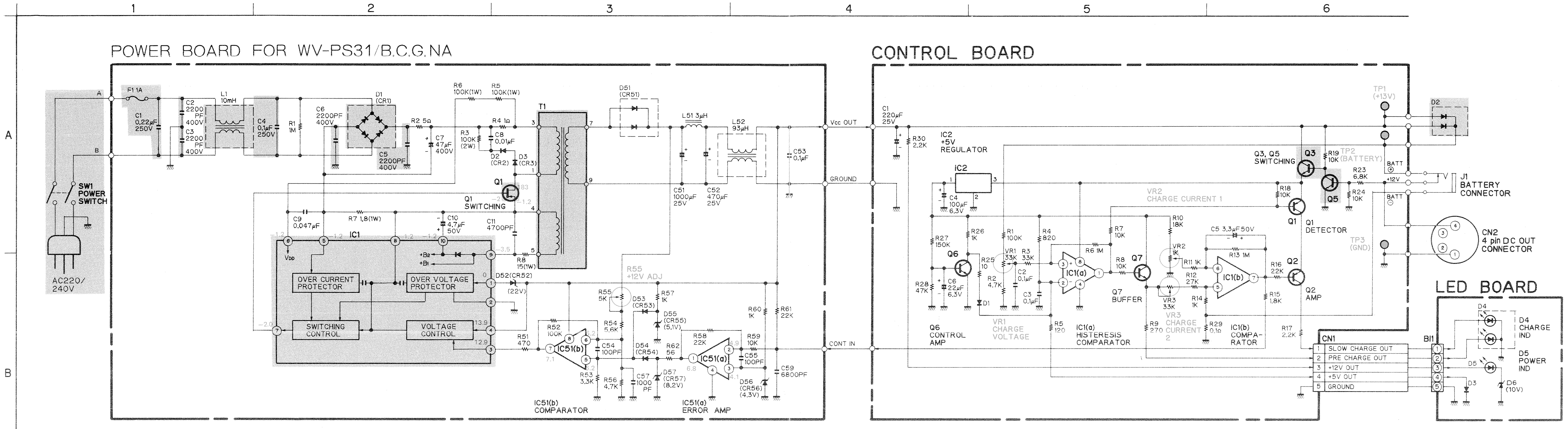
IC1	NJM2904	C5
IC2	YWNJM78L05A	D5
Q1	2SA564-QRS	D5
Q2	2SA564-QRS	D5
Q3	2SC1318-QR	D4
Q5	2SC828-QRS	D4
Q6	2SC828A-QRS	D4
Q7	2SC828-QRS	C5
D1	MA165	D4
D2	YF5BL2C41	C4,D4

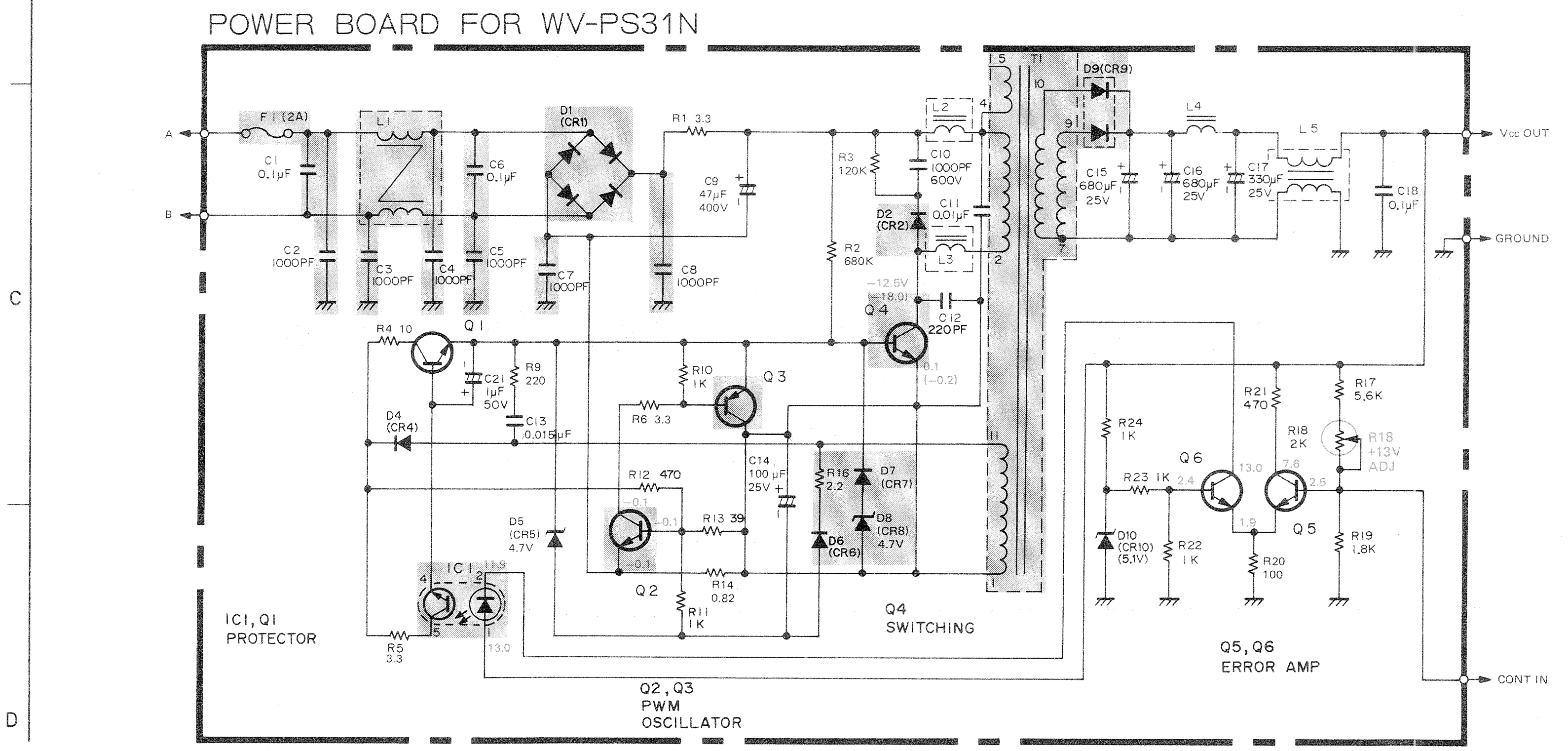

POWER BOARD FOR WV-PS31/B.C.G.NA
(CN1) BATTERY CONNECTOR
(CN2) 4 pin DC CONNECTOR
NOTE : CONNECTOR NUMBER SHOWS WITH ( ) ARE MISCELLANEOUS PART
D1(CR1)
IC1
D52(CR52) (22V)
C11 4700PF
C9 0.047μF
R61 22K
R60 1K
C59 6800PF
D56 (CR56) (4.3V)
R8 15(1W)
R59 10K
C53 0.1μF
R58 22K
C4 0.1μF 250V
R1 1M
C10 4.7μF 50V
R7 1.8(1W)
L1 10mH
C3 2200PF 400V
C6 2200PF
C5 2200PF 400V
R2 5
C7 47μF 400V
R6 100K(1W)
R51 470
R52 100K
R56 4.7K
R53 3.3K
IC51
C55 100PF
L52 93μH
C54 100PF
C57 1000PF
D54 (CR54)
D53 (CR53)
C52 470μF 25V
L51 3μH
C1 0.22μF250V
C2 2200PF 400V
R4 1
R5 100K(1W)
T1
R57 1K
R62 56
C8 0.01μF
D2 (CR2)
D57 (CR57) (8.2V)
D55 (CR55) (5.1V)
R54 5.6K
R55 5K
F1(1A)
R3 100K(2W)
D3 (CR3)
C51 1000μF 25V
R55 +12V ADJ
SW1 POWER SWITCH
GROUND
AC220/240V
Q1
D51 (CR51)
POWER BOARD FOR WV-PS31N
J2
J1
D1(CR1)
R5 33
R1 3.3
IC1
GND
Vcc OUT
C4 1000PF
C6 0.1μF
C7 1000PF
C8 1000PF
C18 0.1μF
Q6
F1 (2A)
C1 0.1μF
C2 1000PF
C3 1000PF
L1
C5 1000PF
C9 47 PF
R22 1K
R24 1K
L5
R23 1K
R21 470
R17 5.6K
C17 330μF 25V
L4
Q2
R10 1K
L2
R3 120K
C10 1000PF
T1
To Power Switch
R12 470
R16 2.2
Q3
R6 33
R14 0.82
R2 680K
D10(CR10)(5.1V)
R20 100
Q5
R19 1.8K
R18 2K
R18 +13V ADJ
C21 1μF 50V
R4 10
C13 0.015μF
R9 220
D6(CR6)
R13 39
R11 1K
C14 100μF 25V
D2 (CR2)
C12 220PF
C11 0.01μF
C16 680μF 25V
CONT
Q1
D5 (CR5) (4.7V)
D7 (CR7)
D8(CR8)
L3
C15 680μF 25V
D9 (CR9)
Q4
BAT⊕
+12V
+12V
BAT⊖
GND
TP2 (BATTERY)
TP1 (+13V)
Q3
R23 6.8K
R25 10
D1
Q6
R26 1K
R27 150K
R29 0.1
Q1
R18 10K
C6 22μF 6.3V
R19 10K
Q5
R24 10K
C5 3.3μF 50V
R15 1.8K
R16 22K
D2
A
K
A
VR2 CHARGE CURRENT 1
VR2 1K
R11 1K
R13 1M
R1 100K
R10 18K
R7 10K
IC1
GND
VCC
C1 220μF 25V
VR1 33K
R3 33K
R6 1M
R4 820
VR1 CHARGE VOLTAGE
R2 4.7K
C2 0.1μF
C3 0.1μF
R5 120
CONTROL BOARD
SLOW CHARGE
PRE CHARGE
+13V OUT
+5V OUT
GROUND
LED BOARD
B11
D3
D4
D6
D5
B11
D
C
B
A
1
2
3
4

CONDUCTOR VIEW OF POWER BOARD, CONTROL BOARD (WV-PS31)


POWER BOARD FOR WV-PS31/B.C.G.NA
D1(CR1)
IC1
D52(CR52) (22V)
C4 0.1µF 250V
R1 1M
C10 4.7µF 50V
C11 4700PF
C9 0.047µF
R8 15(1W)
R7 1.8(1W)
R61 22K
R60 1K
C59 6800PF
D56 (CR56) (4.3V)
R59 10K
C53 0.1µF
R58 22K
C3 2200PF 400V
C6 2200PF
C5 400V 2200PF
R2 5
C7 47µF 400V
R6 100K(1W)
R51 470
R52 100K
R56 4.7K
R53 3.3K
IC51
C55 100PF
L52 93µH
C54 100PF
C57 1000PF
C52 470µF 25V
D54 (CR54)
D53 (CR53)
L51 3µH
C1 0.22µF 250V
C2 2200PF 400V
R5 100K(1W)
T1
R41
C8 0.01µF
D2 (CR2)
R3 100K(2W)
D3 (CR3)
R57 1K
R62 56
D57 (CR57) (8.2V)
D55 (CR55) (5.1V)
C51 1000µF 25V
R54 5.6K
R55 5K
R55 +12V ADJ
Q1
D51 (CR51)
POWER SWITCH
GROUND
(CN1) BATTERY CONNECTOR
(CN2) 4 pin DC OUT CONNECTOR
NOTE : CONNECTOR NUMBER SHOWS WITH ( ) ARE MISCELLANEOUS PART
BAT⊕
+12V
+H2V
BAT⊖
GND
TP3 (GROUND)
TP2 (BATTERY)
TP1 (+13V)
Q3
R23 6.8K
R25 10
R26 1K
R27 150K
R29 0.1
D1
Q6
C6 22µF 6.3V
Q1
IC2
C4 100µF 6.3V
R18 10K
Q2
R19 10K
Q5
R24 10K
R28 47K
C5 3.3µF 50V
R15 1.8K
R14 1K
CONT
R17 2.2K
R16 22K
D2
A
K
A
VR2 1K
R11 1K
R13 1M
VR3 33K
VR2 CHARGE CURRENT 1
VR3 CHARGE CURRENT 2
R1 100K
R12 27K
CN1
R10 18K
IC1
Q7
R7 10K
R8 10K
R9 270
GND
C1 220µF 25V
VR1 33K
VCC
R3 33K
R6 1M
VR1 CHARGE VOLTAGE
R2 4.7K
C2 0.1µF
C3 0.1µF
R4 820
R5 120
R30 2.2K
CONTROL BOARD
CN1
SLOW CHARGE OUT
PRE CHARGE OUT
+13V OUT
+5V OUT
GROUND
LED BOARD
BI1
D3
D4
D5
D6
POWER BOARD FOR WV-PS31N
J2
J1
R5 33
R1 3.3
D1(CR1)
IC1
C4 1000PF
C6 0.1µF
C8 1000PF
C7 1000PF
L1
GND
Vcc OUT
C18 0.1µF
C5 1000PF
C9 47 PF
Q6
R22 1K
R24 1K
L5
R23 1K
R21 470
R17 5.6K
C17 330µF 25V
L4
Q2
R10 1K
Q3
R12 470
R16 2.2
R13 39
R11 1K
R15 33
R14 0.82
R2 680K
R3 120K
C10 1000PF
L2
T1
C13 0.015µF
R9 220
D6(CR6)
C14 100µF 25V
D7 (CR7)
D8(CR8)
D2 (CR2)
C12 220µF
C11 0.01µF
D10(CR10)(5.1V)
R20 100
R19 1.8K
R18 2K
Q5
R18 +13V ADJ
C16 680µF 25V
C15 680µF 25V
CONT
D5 (CR6) (4.7V)
Q4
L3
D9 (CR9)
2
3
4
5


2SK538
G D S
TLP531GR
6 1 2 3
2SA1020Y
E C B
2SC2655Y
2SC2792
B C E
AC037
10
1
KBPC604
~ + ~
ERB44-08
RGP10K
K
Silver
A
1SS118
K K
Black
A A
1J4B4L
① ② ③ ④
1S954
K K
Green
Yellow
A A
RD4.3EB
RD5.1FBZ
RD8.2EB
K K
Black
A A
ESAB82-004
ESAB85-009
A K A
UPC358C
NJM2904M
5
8 1 4
NJM78L05A
1 2 3
2SC943
2SC945QP
2SA564-QR
2SC828-QRS
2SC1318-QR
E C B
RD5.1JSB
K K
Green
A A
MA165
K K
White
A A
5BL2C41
A K A
MA27TA
K K
Yellow
A A
MA4100L
K K
Brown
A A
LN11WP23
G R G R
1 2 3
A K A
A K A
LN21RPHL
K A
K
A


1
2
3
4
5
6
A
B
POWER BOARD FOR WV-PS31/B,C,G,NA
CONTROL BOARD
LED BOARD
AC220/240V
SW1 POWER SWITCH
F1 1A
C1 0.22µF 250V
C2 2200PF 400V
C3 2200PF 400V
L1 10mH
C4 0.1µF 250V
R1 1M
C6 2200PF 400V
D1 (CR1)
C5 2200PF 400V
R2 5Ω
C7 47µF 400V
R6 100K(1W)
R5 100K(1W)
R3 100K (2W)
R4 1Ω
C8 0.01µF
D2 (CR2)
D3 (CR3)
Q1 SWITCHING
T1
C9 0.047µF
R7 1.8(1W)
C10 4.7µF 50V
C11 4700PF
IC1
OVER CURRENT PROTECTOR
OVER VOLTAGE PROTECTOR
SWITCHING CONTROL
VOLTAGE CONTROL
R8 15(1W)
D52(CR52) (22V)
D51 (CR51)
L51 3µH
L52 93µH
C51 1000µF 25V
C52 470µF 25V
C53 0.1µF
R55 +12V ADJ
R55 5K
R52 100K
R54 5.6K
D53 (CR53)
R57 1K
D55 (CR55) (5.1V)
R60 1K
R61 22K
R51 470
IC51(b)
C54 100PF
D54 (CR54)
R62 56
R58 22K
IC51(a)
R59 10K
C55 100PF
C59 6800PF
R53 3.3K
R56 4.7K
C57 1000PF
D57 (CR57) (8.2V)
D56 (CR56) (4.3V)
IC51(b) COMPARATOR
IC51(a) ERROR AMP
Vcc OUT
GROUND
CONT IN
C1 220µF 25V
R30 2.2K
IC2 +5V REGULATOR
IC2
C4 100µF 6.3V
R27 150K
R26 1K
Q6
R25 10
VR1 33K
R3 33K
R1 100K
R4 820
R6 1M
IC1(a)
R28 47K
C6 22µF 6.3V
R2 4.7K
C2 0.1µF
C3 0.1µF
D1
R7 10K
R8 10K
Q7
R10 18K
VR2 1K
R11 1K
R12 27K
VR3 33K
R14 1K
C5 3.3µF 50V
R13 1M
IC1(b)
R16 22K
Q2
R15 1.8K
VR2 CHARGE CURRENT 1
Q3, Q5 SWITCHING
Q3
R19 10K
R18 10K
Q1
Q5
R23 6.8K
R24 10K
Q1 DETECTOR
TP1 (+13V)
TP2 (BATTERY)
TP3 (GND)
D2
BATT ⊕
+12V
BATT ⊖
J1 BATTERY CONNECTOR
CN2 4 pin DC OUT CONNECTOR
Q6 CONTROL AMP
VR1 CHARGE VOLTAGE
R5 120
IC1(a) HISTERESIS COMPARATOR
Q7 BUFFER
R9 270
VR3 CHARGE CURRENT 2
R29 0.1Ω
IC1(b) COMPA-RATOR
Q2 AMP
R17 2.2K
CN1
1 SLOW CHARGE OUT
2 PRE CHARGE OUT
3 +12V OUT
4 +5V OUT
5 GROUND
BI1
D4
D4 CHARGE IND
D5
D5 POWER IND
D3
D6 (10V)


C
D
POWER BOARD FOR WV-PS31N
F1 (2A)
C1 0.1µF
L1
C6 0.1µF
D1 (CR1)
C2 1000PF
C3 1000PF
C4 1000PF
C5 1000PF
C7 1000PF
C8 1000PF
R1 3.3
C9 47µF 400V
R3 120K
L2
C10 1000PF 600V
D2 (CR2)
C11 0.01µF
L3
R2 680K
C12 220PF
Q4
T1
D9(CR9)
L4
C15 680µF 25V
C16 680µF 25V
C17 330µF 25V
L5
C18 0.1µF
Vcc OUT
GROUND
CONT IN
R4 10
Q1
C21 1µF 50V
R9 220
D4 (CR4)
C13 0.015µF
R10 1K
Q3
R6 3.3
C14 100µF 25V
R12 470
R16 2.2
D7 (CR7)
D8 (CR8) 4.7V
D6 (CR6)
D5 (CR5) 4.7V
R13 39
R14 0.82
Q2
R11 1K
IC1
R5 3.3
IC1, Q1 PROTECTOR
Q2, Q3 PWM OSCILLATOR
Q4 SWITCHING
R24 1K
R21 470
R18 2K
R17 5.6K
R18 +13V ADJ
Q6
R23 1K
R22 1K
D10 (CR10) (5.1V)
Q5
R20 100
R19 1.8K
Q5, Q6 ERROR AMP

Control Board

Symbol Number		Q1			Q2			Q3			Q5			Q6			Q7			IC1 (a)			IC1 (b)			IC2		
Condition	Point	B	C	E	B	C	E	B	C	E	B	C	E	B	C	E	B	C	E	Pin1	Pin2	Pin3	Pin5	Pin6	Pin7	Pin1	Pin2	Pin3
AC Adapter Use		0.7	0	0.7	1.9	0	0	0	13.0	0.7	0.7	0	0	0	0	0	0.6	0	0	0.6	0	1.7	0	0	1.9	0.7	0	0
Batlery Charger Use	Bagining of Charging	11.8	12.4	12.4	11.5	12.4	12.4	13.2	14.4	12.4	0	13.2	0	0.6	1.4	0	0.7	0.9	0.2	0.7	2.2	1.9	0.1	0.1	1.5	12.4	0	4.9
	Campletion of Charging	12.3	1.9	12.9	1.4	1.7	1.9	13.5	15.1	12.9	0	13.5	0	0.7	1.5	0	11.6	4.9	4.9	11.6	2.2	2.5	0.1	0.1	1.4	12.9	0	4.9

Power Board For WV-PS31/B.C.G.NA

IC1	AC037	B2
IC51	UPC358C	B3
Q1	2SK538 or 2SK415	A3
D1	1J4B41	A2
D2	ERB44-08 or SM-1AH-10	A3
D3	ERB44-08 or SM-1AH-10	A3
D51	ESAB85-009	A3
D52	RD22EB	B3
D53	1SS118 or 15954 or MA171	B3
D54	1SS118 or 1S954 or MA171	B3
D55	RD5.1JSB	B3
D56	RD4.3EB	B4
D57	RD8.2EB	B3

Power Board For WV-PS31N

IC1	TLP531GR	D1,D2
Q1	2SC2655Y	C1
Q2	2SC945Q or 2SC945P	D2
Q3	2SA1020Y	C2
Q4	2SC2792	C3
Q5	2SC945Q or 2SC945P	C3
Q6	2SC945Q or 2SC945P	C3
D1	KBPC606	C2
D2	RGP10K	C3
D4	1SS118 or 1S954	C1
D5	RD4.7EB2	D2
D6	1SS118 or 1S954	D2
D7	1SS118 or 1S954	C2
D8	RD4.7EB2	D2
D9	ESAB82-004	C3
D10	RD5.1EBZ	D3

LED Board

D3	MA27TA	B6
D4	LN11WP23	B6
D5	LN21RPHL	B6
D6	MA4100L	B6

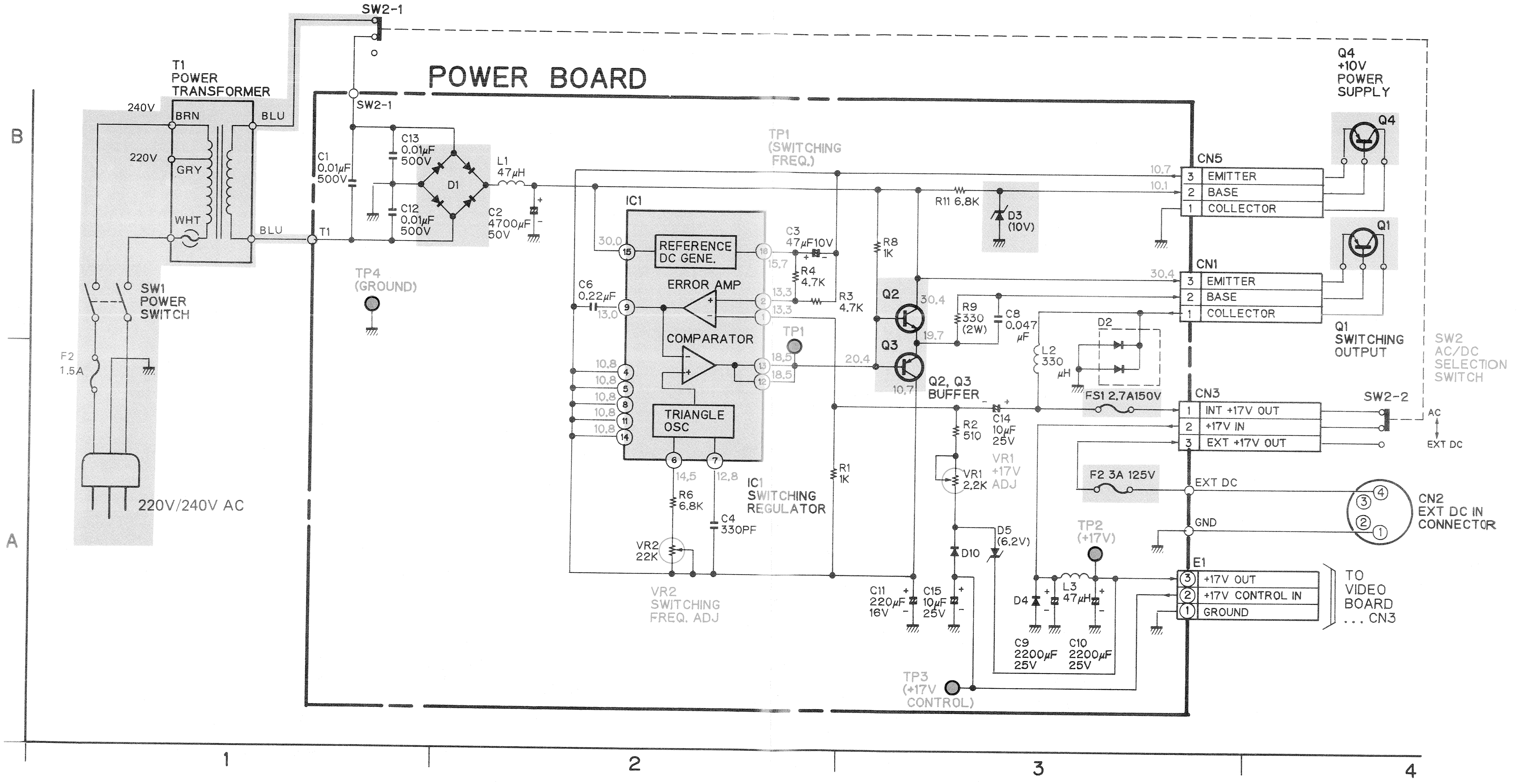
Control Board

IC1	NJM2904	B5,B6
IC2	YWNJM78L05A	A4,A5
Q1	2SA564-QRS	A6
Q2	2SA564-QRS	B6
Q3	2SC1318-QR	A6
Q5	2SC828-QRS	A6
Q6	2SC828A-QRS	B4
Q7	2SC828-QRS	B5
D1	MA165	B5
D2	YF5BL2C41	A6

PRODUCT SAFETY NOTE

The shaded area on this schematic diagram incorporates special features important for protection from X-Radiation, fire and electrical shock hazards. When servicing it is essential that only manufacturer's specified parts be used for the critical components in the shaded areas of the schematic.

SCHEMATIC DIAGRAM OF POWER BOARD (WV-RC33)


SW2-1
POWER BOARD
T1
POWER
TRANSFORMER
240V
BRN
BLU
220V
GRY
WHT
BLU
T1
SW2-1
C1
0.01μF
500V
C13
0.01μF
500V
C12
0.01μF
500V
D1
L1
47μH
C2
4700μF
50V
TP1
(SWITCHING
FREQ.)
IC1
REFERENCE
DC GENE.
ERROR AMP
COMPARATOR
TRIANGLE
OSC
C3
47μF10V
R4
4.7K
R3
4.7K
C6
0.22μF
TP1
TP4
(GROUND)
R6
6.8K
C4
330PF
VR2
22K
VR2
SWITCHING
FREQ. ADJ
IC1
SWITCHING
REGULATOR
R1
1K
R8
1K
R11 6.8K
D3
(10V)
Q2
Q3
Q2, Q3
BUFFER
R9
330
(2W)
C8
0.047
μF
L2
330
μH
D2
FS1 2.7A150V
C14
10μF
25V
R2
510
VR1
2.2K
VR1
+17V
ADJ
F2 3A 125V
D5
(6.2V)
D10
TP2
(+17V)
C11
220μF
16V
C15
10μF
25V
D4
L3
47μH
C9
2200μF
25V
C10
2200μF
25V
TP3
(+17V
CONTROL)
CN5
3 EMITTER
2 BASE
1 COLLECTOR
CN1
3 EMITTER
2 BASE
1 COLLECTOR
CN3
1 INT +17V OUT
2 +17V IN
3 EXT +17V OUT
EXT DC
GND
E1
3 +17V OUT
2 +17V CONTROL IN
1 GROUND
TO
VIDEO
BOARD
... CN3
Q4
+10V
POWER
SUPPLY
Q4
Q1
Q1
SWITCHING
OUTPUT
SW2
AC/DC
SELECTION
SWITCH
SW2-2
AC
EXT DC
CN2
EXT DC IN
CONNECTOR
SW1
POWER
SWITCH
F2
1.5A
220V/240V AC
10.7
10.1
30.0
15.7
13.3
13.3
13.0
18.5
18.5
20.4
30.4
30.4
19.7
10.7
10.8
10.8
10.8
10.8
10.8
14.5
12.8
B
A
1
2
3
4

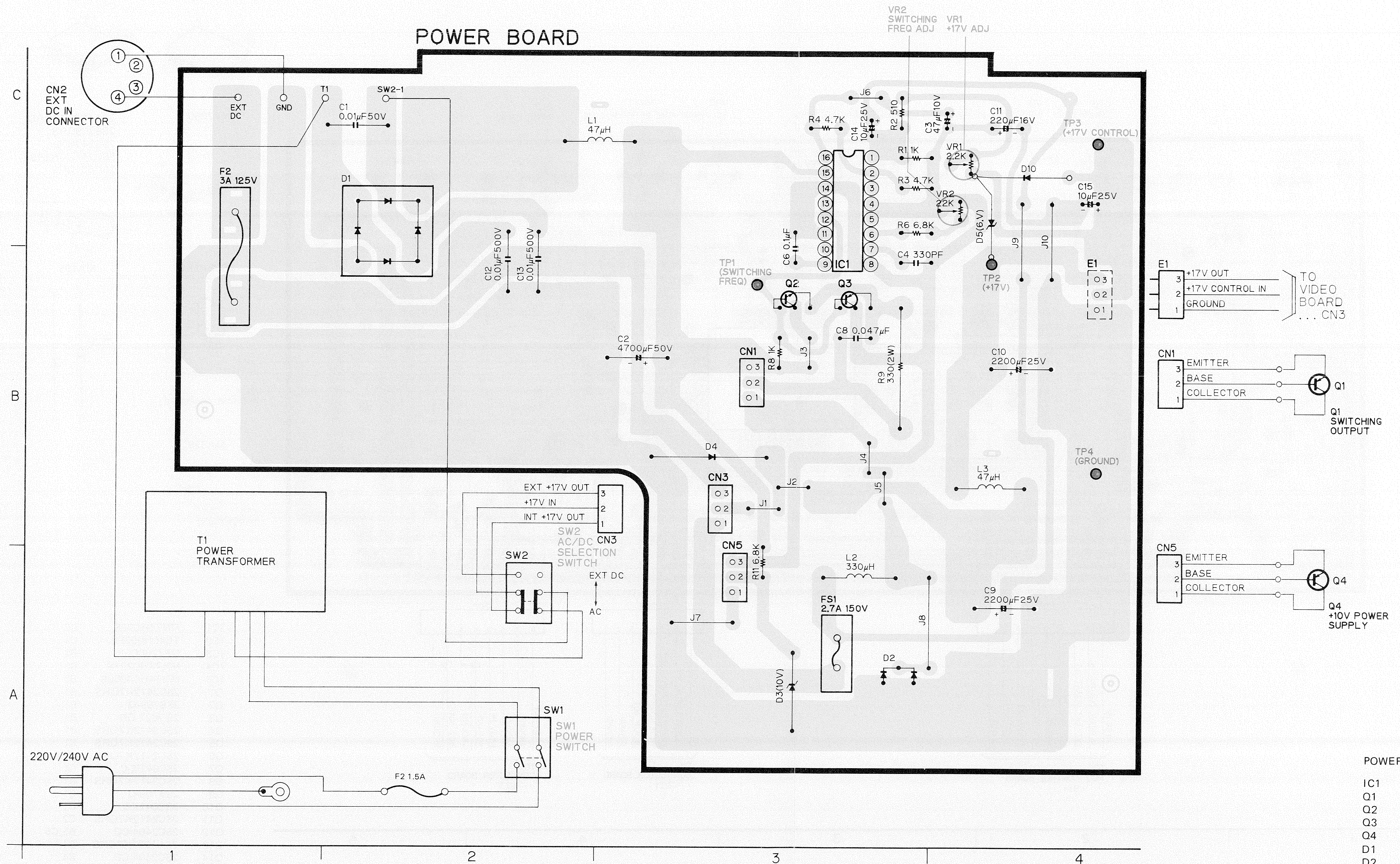
POWER BOARD

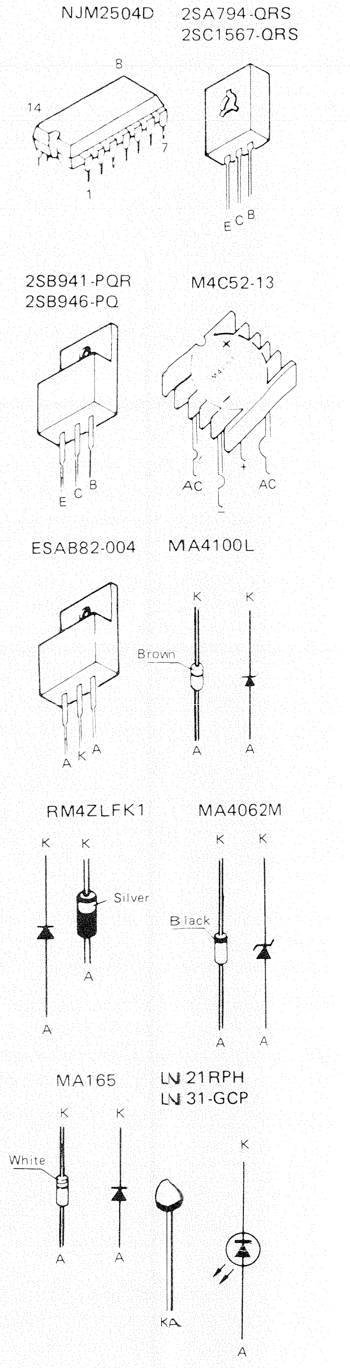
IC1	NJM3524D	A2,B2	D1	M4C52-13	B2
Q1	2SB941-PQR	B4	D2	ESAB82-004	A3
Q2	2SC1567-QRS	B3	D3	MA4100L	B3
Q3	2SA794-QRS	A3	D4	RM4ZLFK1	A3
Q4	2SB946-PQ	B4	D5	MA4062M	A3
			D10	MA165	A3

PRODUCT SAFETY NOTE

The shaded area on this schematic diagram incorporates special features important for protection from X-Radiation, fire and electrical shock hazards. When servicing it is essential that only manufacturer's specified parts be used for the critical components in the shaded areas of the schematic.

CONDUCTOR VIEW OF POWER BOARD (WV-RC33)


POWER BOARD
CN2 EXT DC IN CONNECTOR
EXT DC
GND
T1
SW2-1
C1 0.01μF50V
L1 47μH
F2 3A 125V
D1
C12 0.01μF500V
C13 0.01μF500V
C2 4700μF50V
VR2 SWITCHING FREQ ADJ
VR1 +17V ADJ
J6
R4 4.7K
C14 10μF25V
R2 510
C3 47μF10V
C11 220μF16V
TP3 (+17V CONTROL)
R1 1K
VR1 2.2K
D10
R3 4.7K
VR2 22K
C15 10μF25V
R6 6.8K
D5(6.V)
C6 0.1μF
C4 330PF
J9
J10
IC1
TP1 (SWITCHING FREQ)
TP2 (+17V)
Q2
Q3
E1
C8 0.047μF
CN1
R8 1K
J3
R9 330(2W)
C10 2200μF25V
+17V OUT
+17V CONTROL IN
GROUND
TO VIDEO BOARD ... CN3
EMITTER
BASE
COLLECTOR
Q1
Q1 SWITCHING OUTPUT
D4
TP4 (GROUND)
J4
CN3
J2
J5
L3 47μH
J1
EXT +17V OUT
+17V IN
INT +17V OUT
SW2 AC/DC SELECTION SWITCH
CN3
SW2
EXT DC
AC
T1 POWER TRANSFORMER
CN5
R11 6.8K
L2 330μH
C9 2200μF25V
CN5
Q4
Q4 +10V POWER SUPPLY
FS1 2.7A 150V
J7
J8
D2
D3(10V)
SW1
SW1 POWER SWITCH
220V/240V AC
F2 1.5A
C
B
A
1
2
3
4

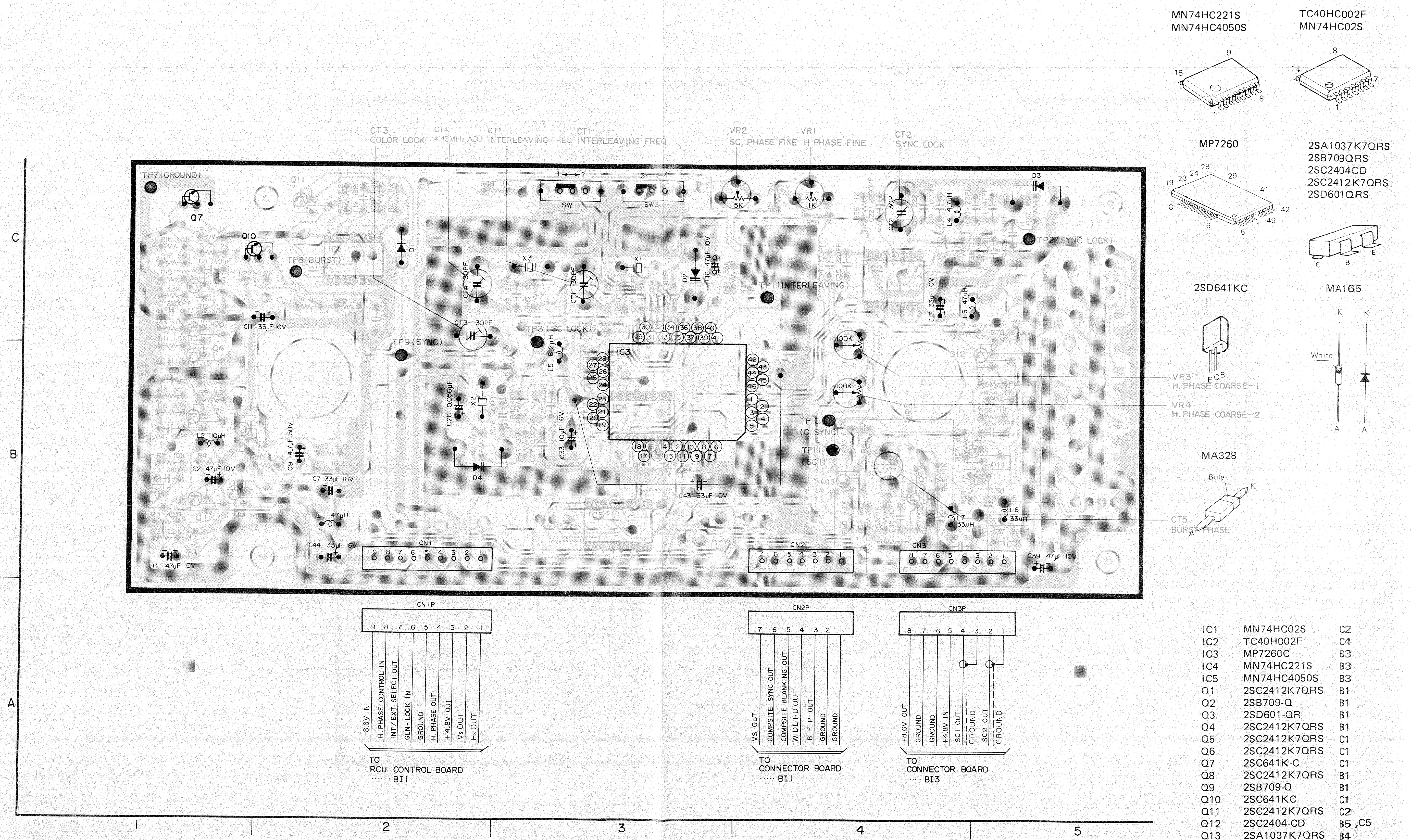

NJM2504D
2SA794-QRS
2SC1567-QRS
8
14
7
1
E C B
2SB941-PQR
2SB946-PQ
M4C52-13
E C B
AC
AC
ESAB82-004
MA4100L
K
K
Brown
A K A
A
A
RM4ZLFK1
MA4062M
K
K
K
K
Silver
Black
A
A
A
A
MA165
LN 21RPH
LN 31-GCP
K
K
K
White
A
A
KA
A

POWER BOARD

IC1	NJM3524D	C3
Q1	2SB941-PQR	B5
Q2	2SC1567-QRS	B3
Q3	2SA794-QRS	B3
Q4	2SB946-PQ	A5
D1	M4C52-13	B2,C2
D2	ESAB82-004	A3
D3	MA4100L	A3
D4	RM4ZLFK1	B3
D5	MA4062M	B3
D10	MA165	C4

CONDUCTOR VIEW OF GEN-LOCK BOARD (WV-AD33)

PAL GEN-LOCK BOARD

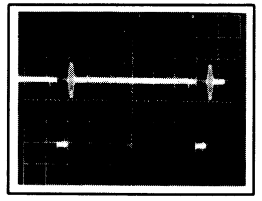

MN74HC221S
MN74HC4050S
TC40HC002F
MN74HC02S
MP7260
2SA1037K7QRS
2SB709QRS
2SC2404CD
2SC2412K7QRS
2SD601QRS
C
B
E
2SD641KC
E C B
MA165
K
White
A
MA328
Bule
CT3
COLOR LOCK
CT4
4.43MHz ADJ
CT1
INTERLEAVING FREQ
CT1
INTERLEAVING FREQ
VR2
SC. PHASE FINE
VR1
H.PHASE FINE
CT2
SYNC LOCK
VR3
H. PHASE COARSE-1
VR4
H. PHASE COARSE-2
CT5
BURST PHASE
TP7(GROUND)
TP8(BURST)
TP9(SYNC)
TP3(SC LOCK)
TP1(INTERLEAVING)
TP2(SYNC LOCK)
TP10
(C SYNC)
TP11
(SCI)
SW1
SW2
IC1
IC2
IC3
IC4
IC5
CN1
CN2
CN3
CN1P
9 8 7 6 5 4 3 2 1
+8.6V IN
H. PHASE CONTROL IN
INT/EXT SELECT OUT
GEN-LOCK IN
GROUND
H. PHASE OUT
+4.8V OUT
Vs OUT
Hs OUT
TO
RCU CONTROL BOARD
······BI1
CN2P
7 6 5 4 3 2 1
VS OUT
COMPSITE SYNC OUT
COMPSITE BLANKING OUT
WIDE HD OUT
B.F.P OUT
GROUND
GROUND
TO
CONNECTOR BOARD
····· BI1
CN3P
8 7 6 5 4 3 2 1
+8.6V OUT
GROUND
GROUND
+4.8V IN
SC1 OUT
GROUND
SC2 OUT
GROUND
TO
CONNECTOR BOARD
······ BI3
A
B
C
1
2
3
4
5

IC1	MN74HC02S	C2
IC2	TC40H002F	C4
IC3	MP7260C	B3
IC4	MN74HC221S	B3
IC5	MN74HC4050S	B3
Q1	2SC2412K7QRS	B1
Q2	2SB709-Q	B1
Q3	2SD601-QR	B1
Q4	2SC2412K7QRS	B1
Q5	2SC2412K7QRS	C1
Q6	2SC2412K7QRS	C1
Q7	2SC641K-C	C1
Q8	2SC2412K7QRS	B1
Q9	2SB709-Q	B1
Q10	2SC641KC	C1
Q11	2SC2412K7QRS	C2
Q12	2SC2404-CD	B5 ,C5
Q13	2SA1037K7QRS	B4
Q14	2SC2404-CD	B4
Q15	2SA1037K7QRS	B4
D1	MA165	C2
D2	MA328	C3
D3	MA328	C5
D4	MA328	B2
D5	MA151K	B1

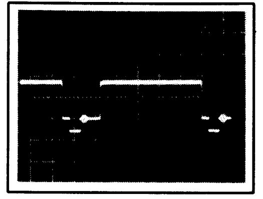
GEN–LOCK BOARD

IC1	MN74HC02S	D4,D5
IC2	TC40H002F	B3
IC3	MP7260C	B4,C4
IC4	MN74HC221S	B5,B6
IC5	MN74HC4050S	A3
Q1	2SC2412K7QRS	D2
Q2	2SB709-Q	D2
Q3	2SD601-QR	D3
Q4	2SC2412K7QRS	D3
Q5	2SC2412K7QRS	D3
Q6	2SC2412K7QRS	D3
Q7	2SC641K-C	D4
Q8	2SC2412K7QRS	D4
Q9	2SB709-Q	D4
Q10	2SC641KC	D5
Q11	2SC2412K7QRS	D5
Q12	2SC2404-CD	A4
Q13	2SA1037K7QRS	A4
Q14	2SC2404-CD	A4
Q15	2SA1037K7QRS	A5
D1	MA165	D5
D2	MA328	C3
D3	MA328	B3
D4	MA328	C5
D5	MA151K	B3

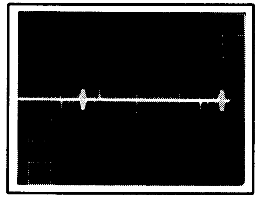
1. 0.1V/DIV, 10µs/DIV



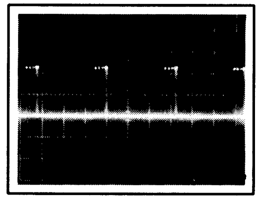
2. 0.5V/DIV, 10µs/DIV



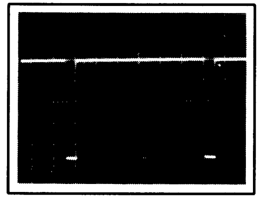
3. 0.5V/DIV, 10µ/DIV



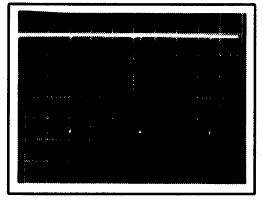
4. 2V/DIV, 20µs/DIV



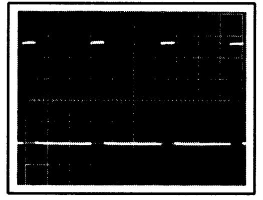
5. 0.5V/DIV, 10µs/DIV



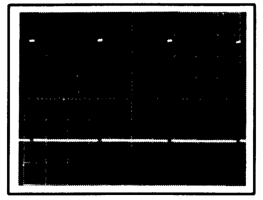
6. 1V/DIV, 20µs/DIV



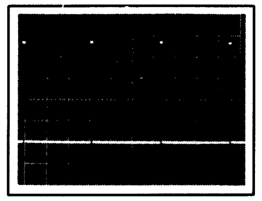
7. 1V/DIV, 20µs/DIV



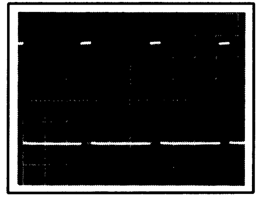
8. 1V/DIV, 20µs/DIV



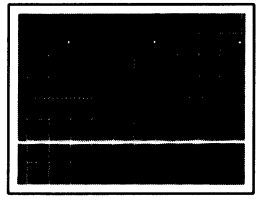
9. 1V/DIV, 20µs/DIV



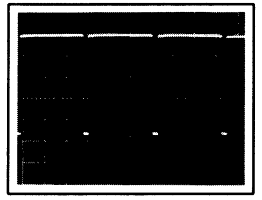
10. 1V/DIV, 20µs/DIV



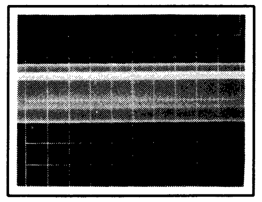
11. 1V/DIV, 5ms/DIV



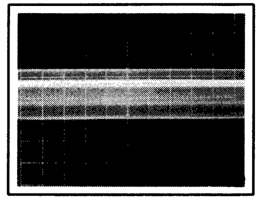
12. 1V/DIV, 20µs/DIV



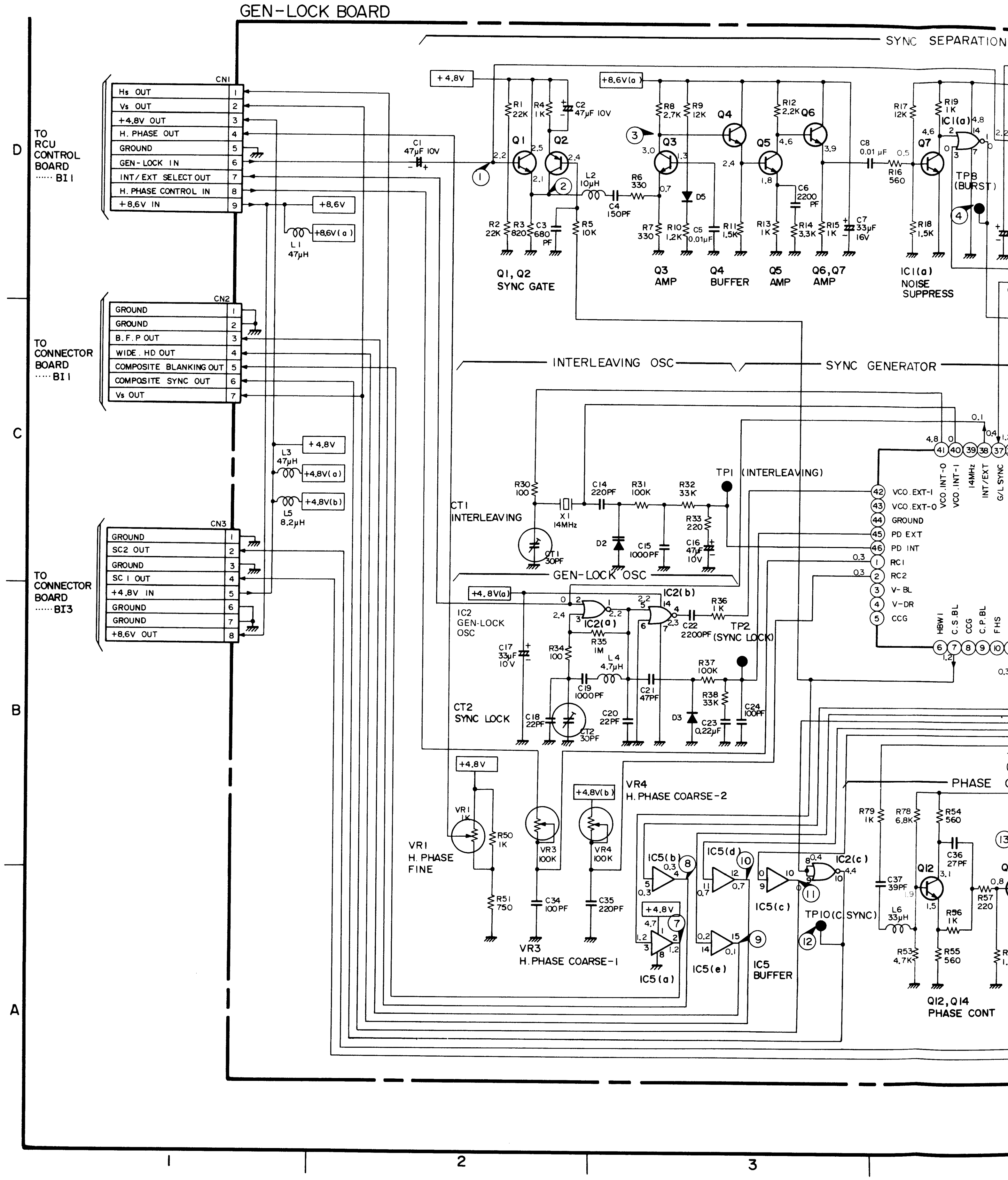
13. 0.5V/DIV, 20µs/DIV



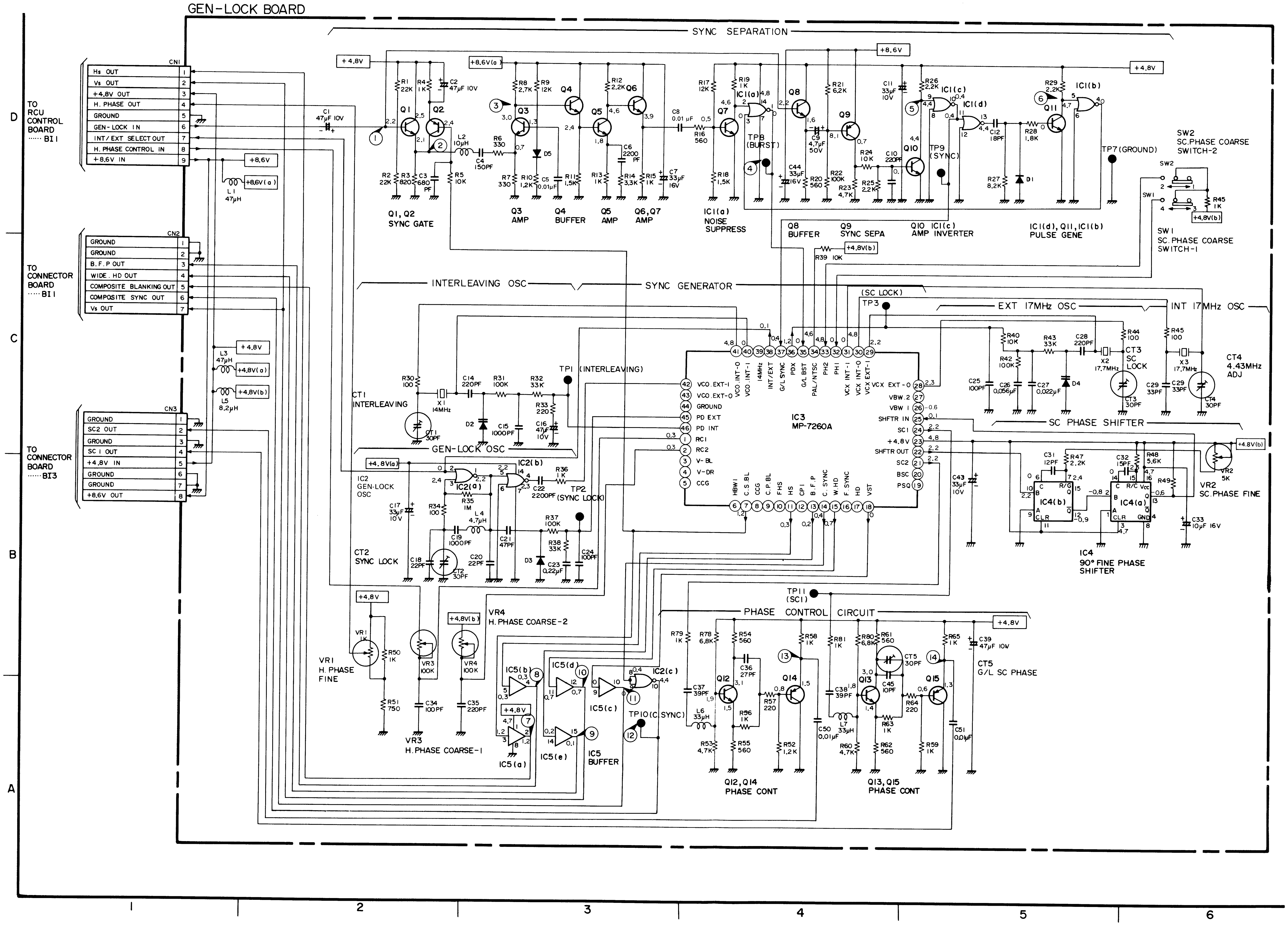
14. 0.5V/DIV, 20µs/DIV



SCHEMATIC DIAGRAM OF GEN-LOCK BOARD (WV-A


GEN–LOCK BOARD
SYNC SEPARATION
TO RCU CONTROL BOARD ······BI1
CN1
Hs OUT
Vs OUT
+4.8V OUT
H. PHASE OUT
GROUND
GEN-LOCK IN
INT/EXT SELECT OUT
H. PHASE CONTROL IN
+8.6V IN
TO CONNECTOR BOARD ······BI1
CN2
GROUND
GROUND
B.F.P OUT
WIDE. HD OUT
COMPOSITE BLANKING OUT
COMPOSITE SYNC OUT
Vs OUT
TO CONNECTOR BOARD ······BI3
CN3
GROUND
SC2 OUT
GROUND
SC1 OUT
+4.8V IN
GROUND
GROUND
+8.6V OUT
+4.8V
+8.6V(a)
+8.6V
+4.8V(a)
+4.8V(b)
L1 47µH
L3 47µH
L5 8.2µH
C1 47µF 10V
Q1, Q2 SYNC GATE
Q3 AMP
Q4 BUFFER
Q5 AMP
Q6,Q7 AMP
IC1(a) NOISE SUPPRESS
TP8 (BURST)
INTERLEAVING OSC
SYNC GENERATOR
TP1 (INTERLEAVING)
CT1 INTERLEAVING
X1 14MHz
GEN-LOCK OSC
IC2 GEN-LOCK OSC
IC2(a)
IC2(b)
TP2 (SYNC LOCK)
CT2 SYNC LOCK
VCO EXT-I
VCO EXT-O
GROUND
PD EXT
PD INT
RC1
RC2
V-BL
V-DR
CCG
VR1 H. PHASE FINE
VR3 H. PHASE COARSE-1
VR4 H. PHASE COARSE-2
IC5(a)
IC5(b)
IC5(c)
IC5(d)
IC5(e)
IC5 BUFFER
IC2(c)
TP10 (C SYNC)
PHASE
Q12, Q14 PHASE CONT
A
B
C
D
1
2
3

SCHEMATIC DIAGRAM OF GEN-LOCK BOARD (WV-AD33)

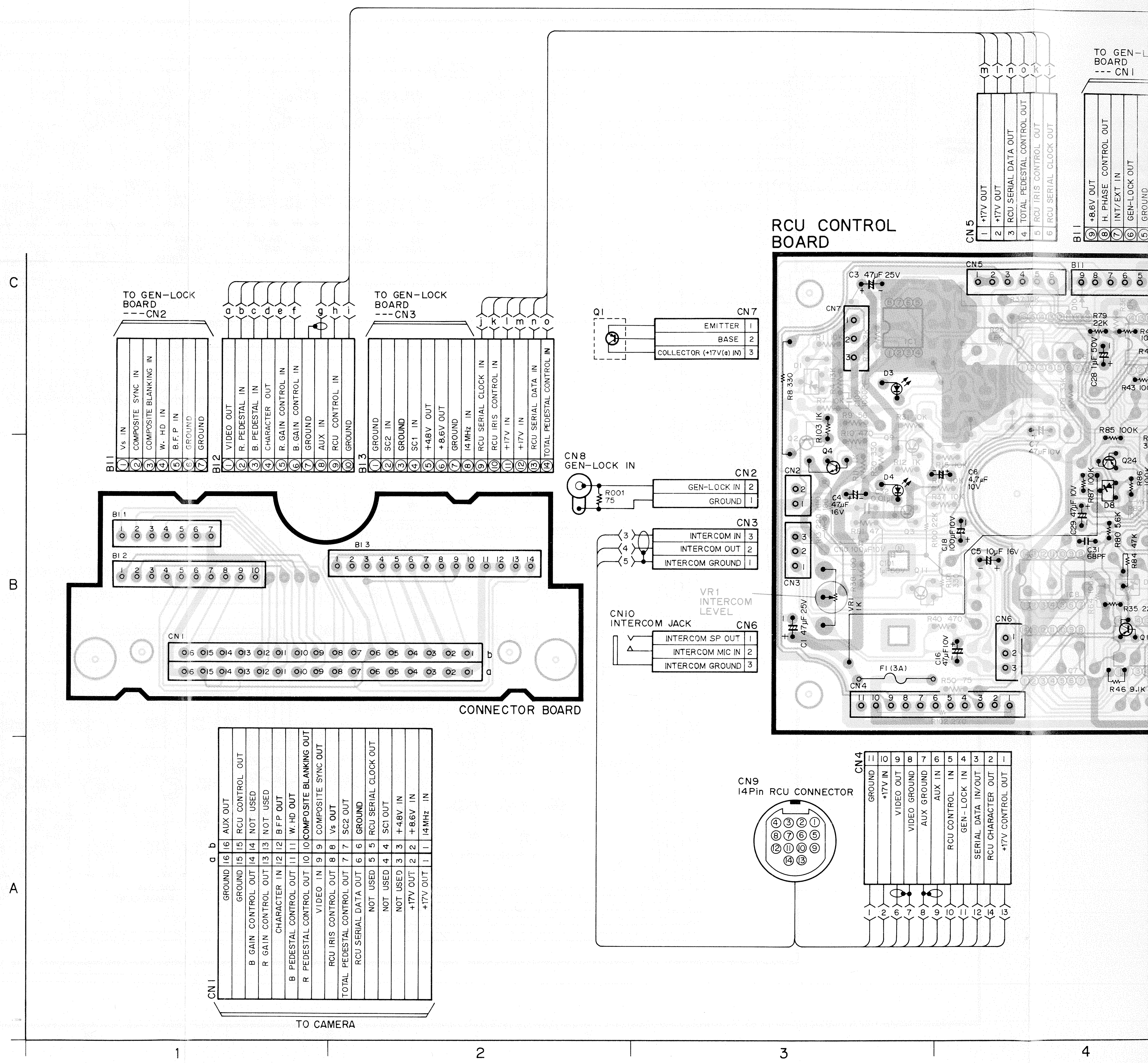


GEN-LOCK BOARD
SYNC SEPARATION
TO RCU CONTROL BOARD ······B11
CN1
Hs OUT
Vs OUT
+4.8V OUT
H. PHASE OUT
GROUND
GEN-LOCK IN
INT/EXT SELECT OUT
H. PHASE CONTROL IN
+8.6V IN
TO CONNECTOR BOARD ······B11
CN2
GROUND
B.F.P OUT
WIDE. HD OUT
COMPOSITE BLANKING OUT
COMPOSITE SYNC OUT
Vs OUT
TO CONNECTOR BOARD ······B13
CN3
SC2 OUT
SC1 OUT
+4.8V IN
+8.6V OUT
Q1, Q2 SYNC GATE
Q3 AMP
Q4 BUFFER
Q5 AMP
Q6, Q7 AMP
IC1(a) NOISE SUPPRESS
Q8 BUFFER
Q9 SYNC SEPA
Q10 IC1(c) AMP INVERTER
IC1(d), Q11, IC1(b) PULSE GENE
TP8 (BURST)
TP9 (SYNC)
TP7 (GROUND)
SW2 SC.PHASE COARSE SWITCH-2
SW1 SC.PHASE COARSE SWITCH-1
INTERLEAVING OSC
SYNC GENERATOR
(SC LOCK) TP3
EXT 17MHz OSC
INT 17MHz OSC
CT1 INTERLEAVING
X1 14MHz
TP1 (INTERLEAVING)
GEN-LOCK OSC
IC2 GEN-LOCK OSC
TP2 (SYNC LOCK)
CT2 SYNC LOCK
IC3 MP-7260A
VCO EXT-I
VCO EXT-O
GROUND
PD EXT
PD INT
RC1
RC2
V-BL
V-DR
CCG
VCX EXT-O
VBW 2
VBW 1
SHFTR IN
SC1
+4.8V
SHFTR OUT
SC2
BSC
PSQ
HBW1
C.S.BL
CCG
C.P.BL
FHS
HS
CP1
B.F.P
C.SYNC
W.HD
F.SYNC
HD
VST
VCO INT-O
VCO INT-I
14MHz
INT/EXT
G/L SYNC
PDX
G/L BST
PAL/NTSC
PH2
PH1
VCX INT-I
VCX INT-O
VCX EXT-I
CT3 SC LOCK
X2 17.7MHz
X3 17.7MHz
CT4 4.43MHz ADJ
SC PHASE SHIFTER
IC4 90° FINE PHASE SHIFTER
VR2 SC.PHASE FINE
VR1 H.PHASE FINE
VR3 H.PHASE COARSE-1
VR4 H.PHASE COARSE-2
IC5(a)
IC5(b)
IC5(c)
IC5(d)
IC5(e)
IC5 BUFFER
IC2(c)
TP10 (C SYNC)
TP11 (SC1)
PHASE CONTROL CIRCUIT
Q12, Q14 PHASE CONT
Q13, Q15 PHASE CONT
CT5 G/L SC PHASE
+4.8V
+8.6V
+8.6V(a)
+4.8V(a)
+4.8V(b)
L1 47μH
L3 47μH
L5 8.2μH
D
C
B
A
1
2
3
4
5
6

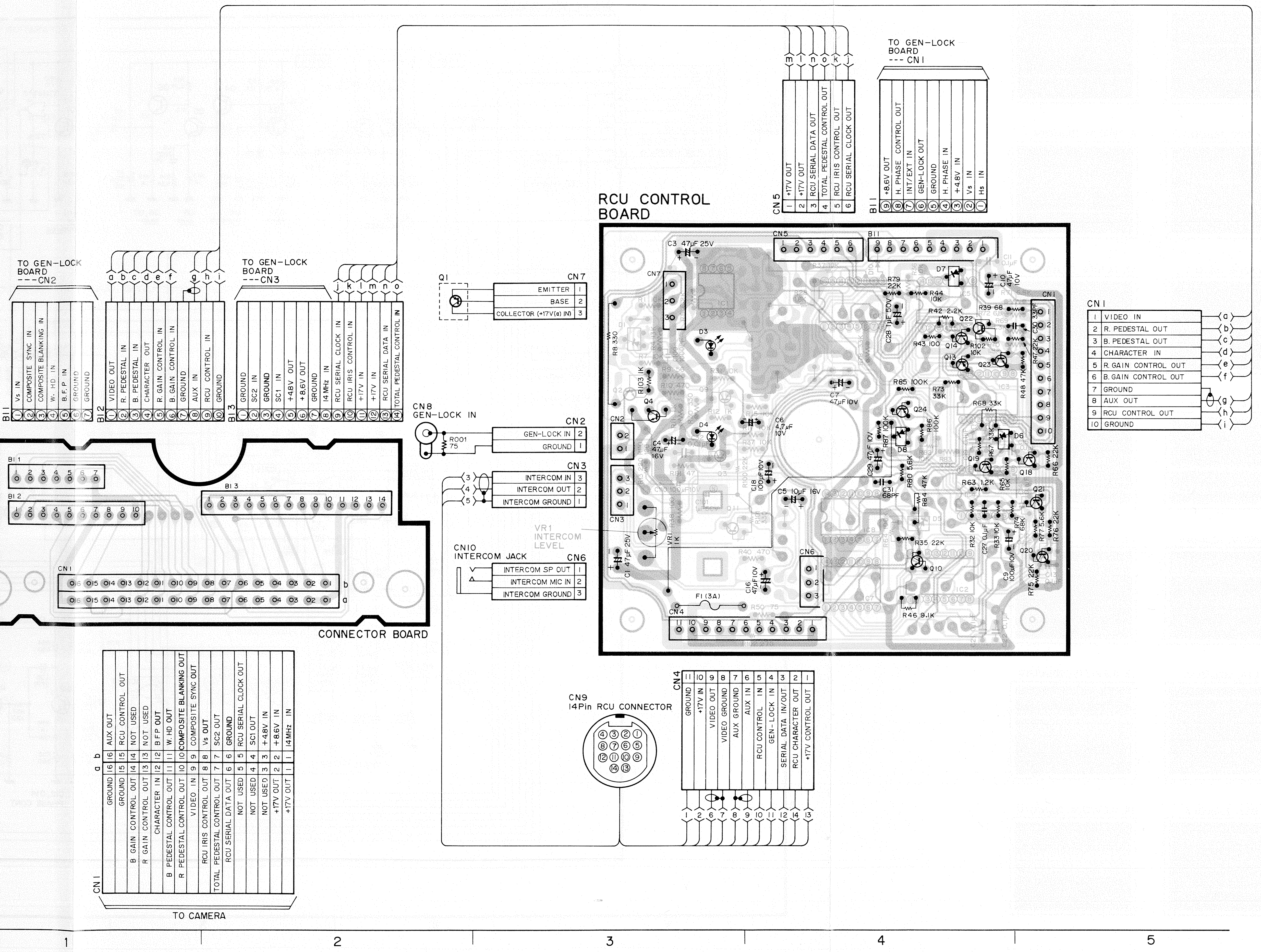
CONDUCTOR VIEW OF RCU CONTROL BOARD , CONNECTOR BOARD (WV-AD33)

RCU CONTROL BOARD

IC1	NJM2904M		C3
IC2	NJU4051BM		B4
IC3	YFNJM064M		B4,C4
IC4	YFNJM064M		B4
IC5	MB84066BF		C4
IC6	NJU4053BM		C4
IC7	YFMB84024BF		B4
IC8	YFNJU40118M		B4
Q1	YF2SB953A-PQ		C2
Q2	2SC1318-RS		C3
Q3	2SA1037K7QRS	(F)	B3
Q4	2SD973-QRS		B3
Q9	2SA1037K7QRS	(T)	B3
Q10	2SA1037K7QRS	(P)	B4
Q11	2SC2412K7QRS	(B)	B3
Q13	2SA1022-BC	(F)	C4
Q14	2SC2404-CD	(U)	C4
Q18	2SA1037K7QRS	(T)	B5
Q19	2SC2412K7QRS	(B)	B4
Q20	2SC2412K7QRS	(B)	B5
Q21	2SA1037K7QRS	(F)	B5
Q22	2SC2404-CD	(U)	C4
Q23	2SC2404-CD	(U)	C4
Q24	2SA1037K7QRS	(F)	B4
D1	MA3056HTW		C3
D3	GL-3PR7H		C3
D4	GL-3HY7H		B3
D5	DAP202KT7		B4
D6	MA151K	(MH)	B4
D7	MA151K	(MH)	C4
D8	MA151K	(MH)	B4
D10	MA165		C4

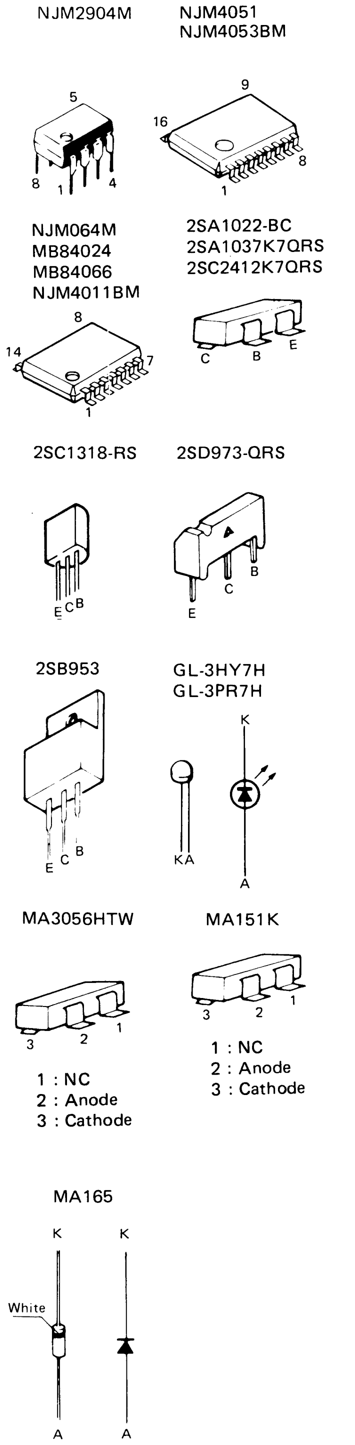

C
B
A
1
2
3
4
TO GEN-LOCK BOARD ---CN2
B11
① Vs IN
② COMPOSITE SYNC IN
③ COMPOSITE BLANKING IN
④ W. HD IN
⑤ B.F.P IN
⑥ GROUND
⑦ GROUND
a b c d e f g h i
B12
① VIDEO OUT
② R. PEDESTAL IN
③ B. PEDESTAL IN
④ CHARACTER OUT
⑤ R. GAIN CONTROL IN
⑥ B. GAIN CONTROL IN
⑦ GROUND
⑧ AUX IN
⑨ RCU CONTROL IN
⑩ GROUND
TO GEN-LOCK BOARD ---CN3
j k l m n o
B13
① GROUND
② SC2 IN
③ GROUND
④ SC1 IN
⑤ +4.8V OUT
⑥ +8.6V OUT
⑦ GROUND
⑧ 14MHz IN
⑨ RCU SERIAL CLOCK IN
⑩ RCU IRIS CONTROL IN
⑪ +17V IN
⑫ +17V IN
⑬ RCU SERIAL DATA IN
⑭ TOTAL PEDESTAL CONTROL IN
B1 1
1 2 3 4 5 6 7
B1 2
1 2 3 4 5 6 7 8 9 10
B1 3
1 2 3 4 5 6 7 8 9 10 11 12 13 14
CN1
16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1
b
a
CONNECTOR BOARD
CN1
a b
16 16 GROUND / AUX OUT
15 15 GROUND / RCU CONTROL OUT
14 14 B GAIN CONTROL OUT / NOT USED
13 13 R GAIN CONTROL OUT / NOT USED
12 12 CHARACTER IN / B FP OUT
11 11 B PEDESTAL CONTROL OUT / W. HD OUT
10 10 R PEDESTAL CONTROL OUT / COMPOSITE BLANKING OUT
9 9 VIDEO IN / COMPOSITE SYNC OUT
8 8 RCU IRIS CONTROL OUT / Vs OUT
7 7 TOTAL PEDESTAL CONTROL OUT / SC2 OUT
6 6 RCU SERIAL DATA OUT / GROUND
5 5 NOT USED / RCU SERIAL CLOCK OUT
4 4 NOT USED / SC1 OUT
3 3 NOT USED / +4.8V IN
2 2 +17V OUT / +8.6V IN
1 1 +17V OUT / 14MHz IN
TO CAMERA
Q1
CN7
EMITTER 1
BASE 2
COLLECTOR (+17V(a) IN) 3
CN8
GEN-LOCK IN
R001
75
CN2
GEN-LOCK IN 2
GROUND 1
CN3
3 4 5
INTERCOM IN 3
INTERCOM OUT 2
INTERCOM GROUND 1
VR1
INTERCOM
LEVEL
CN10
INTERCOM JACK
CN6
INTERCOM SP OUT 1
INTERCOM MIC IN 2
INTERCOM GROUND 3
CN9
14Pin RCU CONNECTOR
① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩ ⑪ ⑫ ⑬ ⑭
CN4
11 GROUND
10 +17V IN
9 VIDEO OUT
8 VIDEO GROUND
7 AUX GROUND
6 AUX IN
5 RCU CONTROL IN
4 GEN-LOCK IN
3 SERIAL DATA IN/OUT
2 RCU CHARACTER OUT
1 +17V CONTROL OUT
1 2 6 7 8 9 10 11 12 14 13
m l n o k j
CN5
1 +17V OUT
2 +17V OUT
3 RCU SERIAL DATA OUT
4 TOTAL PEDESTAL CONTROL OUT
5 RCU IRIS CONTROL OUT
6 RCU SERIAL CLOCK OUT
TO GEN-L
BOARD
--- CN1
B11
⑨ +8.6V OUT
⑧ H. PHASE CONTROL OUT
⑦ INT/EXT IN
⑥ GEN-LOCK OUT
⑤ GROUND
RCU CONTROL BOARD
CN5
1 2 3 4 5 6
B11
9 8 7 6 5
C3 47μF 25V
CN7
IC1
R79 22K
C28 1μF 50V
D3
R8 330
Q1
R103 1K
R9 56
R10 470
Q2
Q4
D4
R12
R43 100
R85 100K
Q24
C7 47μF 10V
C6 4.7μF 10V
C4 47μF 16V
CN2
R87 100K
D8
R86
C29 47μF 10V
R80 5.6K
R84 47K
C31 68PF
C18 100μF 10V
C5 10μF 16V
CN3
VR1 1K
C1 47μF 25V
R35
R40 470
CN6
C16 47μF 10V
F1 (3A)
R50 75
R46 9.1K
CN4
11 10 9 8 7 6 5 4 3 2 1

CONDUCTOR VIEW OF RCU CONTROL BOARD , CONNECTOR BOARD (WV-AD33)



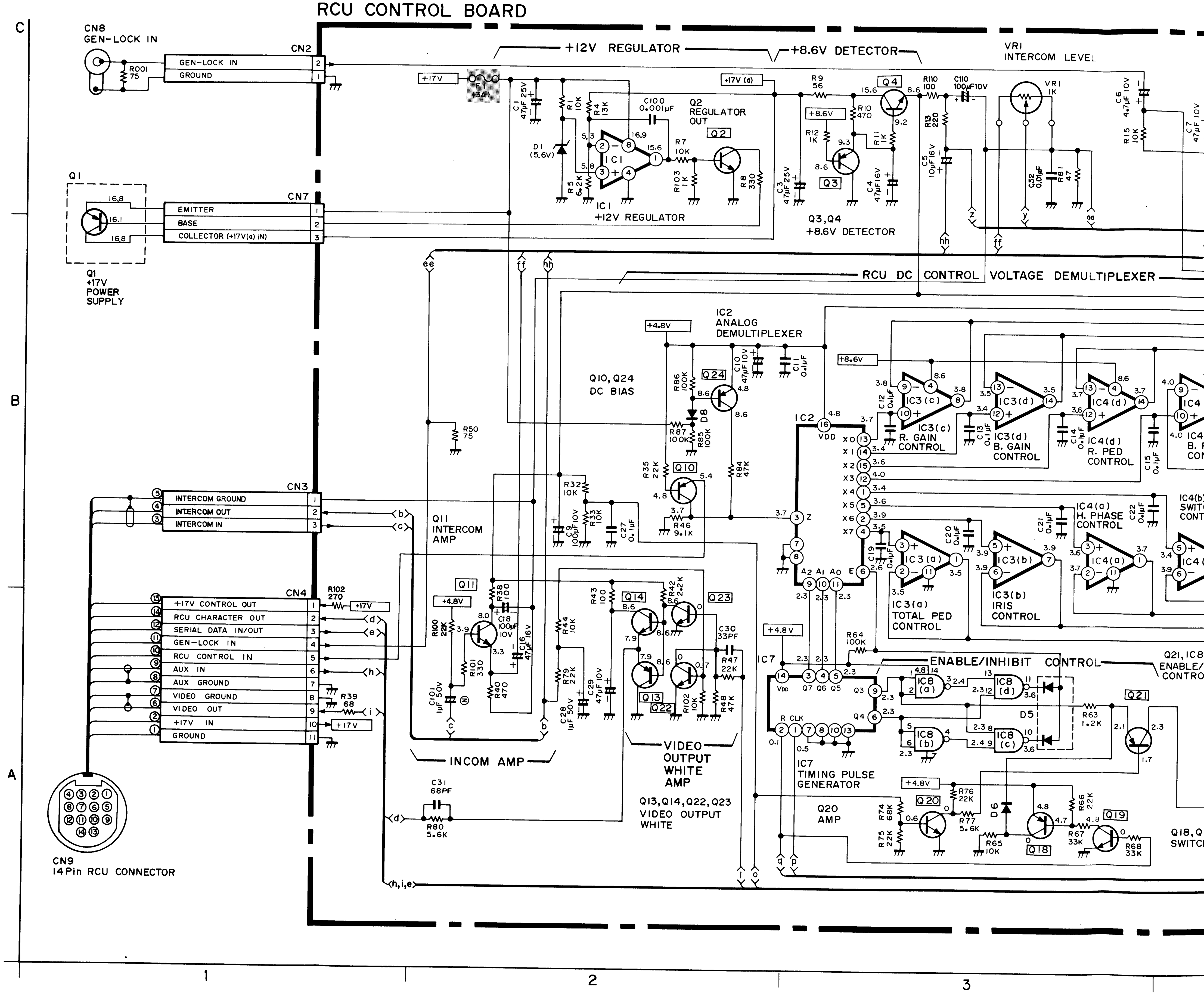
RCU CONTROL BOARD
CONNECTOR BOARD
TO GEN-LOCK BOARD ---CN2
B11: 1 Vs IN, 2 COMPOSITE SYNC IN, 3 COMPOSITE BLANKING IN, 4 W. HD IN, 5 B.F.P IN, 6 GROUND, 7 GROUND
B12: 1 VIDEO OUT, 2 R. PEDESTAL IN, 3 B. PEDESTAL IN, 4 CHARACTER OUT, 5 R. GAIN CONTROL IN, 6 B. GAIN CONTROL IN, 7 GROUND, 8 AUX IN, 9 RCU CONTROL IN, 10 GROUND
a b c d e f g h i
TO GEN-LOCK BOARD ---CN3
B13: 1 GROUND, 2 SC2 IN, 3 GROUND, 4 SC1 IN, 5 +4.8V OUT, 6 +8.6V OUT, 7 GROUND, 8 14 MHz IN, 9 RCU SERIAL CLOCK IN, 10 RCU IRIS CONTROL IN, 11 +17V IN, 12 +17V IN, 13 RCU SERIAL DATA IN, 14 TOTAL PEDESTAL CONTROL IN
j k l m n o
Q1
CN7: EMITTER 1, BASE 2, COLLECTOR (+17V(a) IN) 3
CN8 GEN-LOCK IN
R001 75
CN2: GEN-LOCK IN 2, GROUND 1
CN3: INTERCOM IN 3, INTERCOM OUT 2, INTERCOM GROUND 1
CN10 INTERCOM JACK
CN6: INTERCOM SP OUT 1, INTERCOM MIC IN 2, INTERCOM GROUND 3
VR1 INTERCOM LEVEL
m l n o k j
CN5: 1 +17V OUT, 2 +17V OUT, 3 RCU SERIAL DATA OUT, 4 TOTAL PEDESTAL CONTROL OUT, 5 RCU IRIS CONTROL OUT, 6 RCU SERIAL CLOCK OUT
TO GEN-LOCK BOARD --- CN1
B11: 9 +8.6V OUT, 8 H. PHASE CONTROL OUT, 7 INT/EXT IN, 6 GEN-LOCK OUT, 5 GROUND, 4 H. PHASE IN, 3 +4.8V IN, 2 Vs IN, 1 Hs IN
CN1: 1 VIDEO IN, 2 R. PEDESTAL OUT, 3 B. PEDESTAL OUT, 4 CHARACTER IN, 5 R. GAIN CONTROL OUT, 6 B. GAIN CONTROL OUT, 7 GROUND, 8 AUX OUT, 9 RCU CONTROL OUT, 10 GROUND
a b c d e f g h i
C3 47μF 25V
C1 47μF 25V
C4 47μF 16V
C6 4.7μF 10V
C7 47μF 10V
C18 100μF 10V
C5 10μF 16V
C16 47μF 10V
C28 1μF 50V
C10 47μF 10V
C11 0.1μF
C29 47μF 10V
C31 68PF
C27 0.1μF
C9 100μF 10V
C30 33PF
D3 D4 D6 D7 D8
Q4 Q10 Q13 Q14 Q18 Q19 Q20 Q21 Q22 Q23 Q24
R8 330
R103 1K
R79 22K
R44 10K
R42 2.2K
R39 68
R43 100
R102 10K
R85 100K
R73 33K
R68 33K
R48 47K
R47 22K
R67 33K
R66 22K
R65 10K
R63 1.2K
R87 100K
R86 100K
R80 5.6K
R84 47K
R35 22K
R32 10K
R33 10K
R74 68K
R77 5.6K
R76 22K
R75 22K
R46 9.1K
F1 (3A)
CN4: 11 10 9 8 7 6 5 4 3 2 1
CN9 14Pin RCU CONNECTOR
CN4: 11 GROUND, 10 +17V IN, 9 VIDEO OUT, 8 VIDEO GROUND, 7 AUX GROUND, 6 AUX IN, 5 RCU CONTROL IN, 4 GEN-LOCK IN, 3 SERIAL DATA IN/OUT, 2 RCU CHARACTER OUT, 1 +17V CONTROL OUT
1 2 6 7 8 9 10 11 12 14 13
CN1 (a): 16 GROUND, 15 GROUND, 14 B GAIN CONTROL OUT, 13 R GAIN CONTROL OUT, 12 CHARACTER IN, 11 B PEDESTAL CONTROL OUT, 10 R PEDESTAL CONTROL OUT, 9 VIDEO IN, 8 RCU IRIS CONTROL OUT, 7 TOTAL PEDESTAL CONTROL OUT, 6 RCU SERIAL DATA OUT, 5 NOT USED, 4 NOT USED, 3 NOT USED, 2 +17V OUT, 1 +17V OUT
CN1 (b): 16 AUX OUT, 15 RCU CONTROL OUT, 14 NOT USED, 13 NOT USED, 12 B F P OUT, 11 W. HD OUT, 10 COMPOSITE BLANKING OUT, 9 COMPOSITE SYNC OUT, 8 Vs OUT, 7 SC2 OUT, 6 GROUND, 5 RCU SERIAL CLOCK OUT, 4 SC1 OUT, 3 +4.8V IN, 2 +8.6V IN, 1 14MHz IN
TO CAMERA
1
2
3
4
5

SCHEMATIC DIAGRAM OF RCU CO


NJM2904M
NJM4051
NJM4053BM
NJM064M
MB84024
MB84066
NJM4011BM
2SA1022-BC
2SA1037K7QRS
2SC2412K7QRS
2SC1318-RS
2SD973-QRS
2SB953
GL-3HY7H
GL-3PR7H
MA3056HTW
MA151K
1 : NC
2 : Anode
3 : Cathode
1 : NC
2 : Anode
3 : Cathode
MA165
White
K
A

RCU CONTROL BOARD

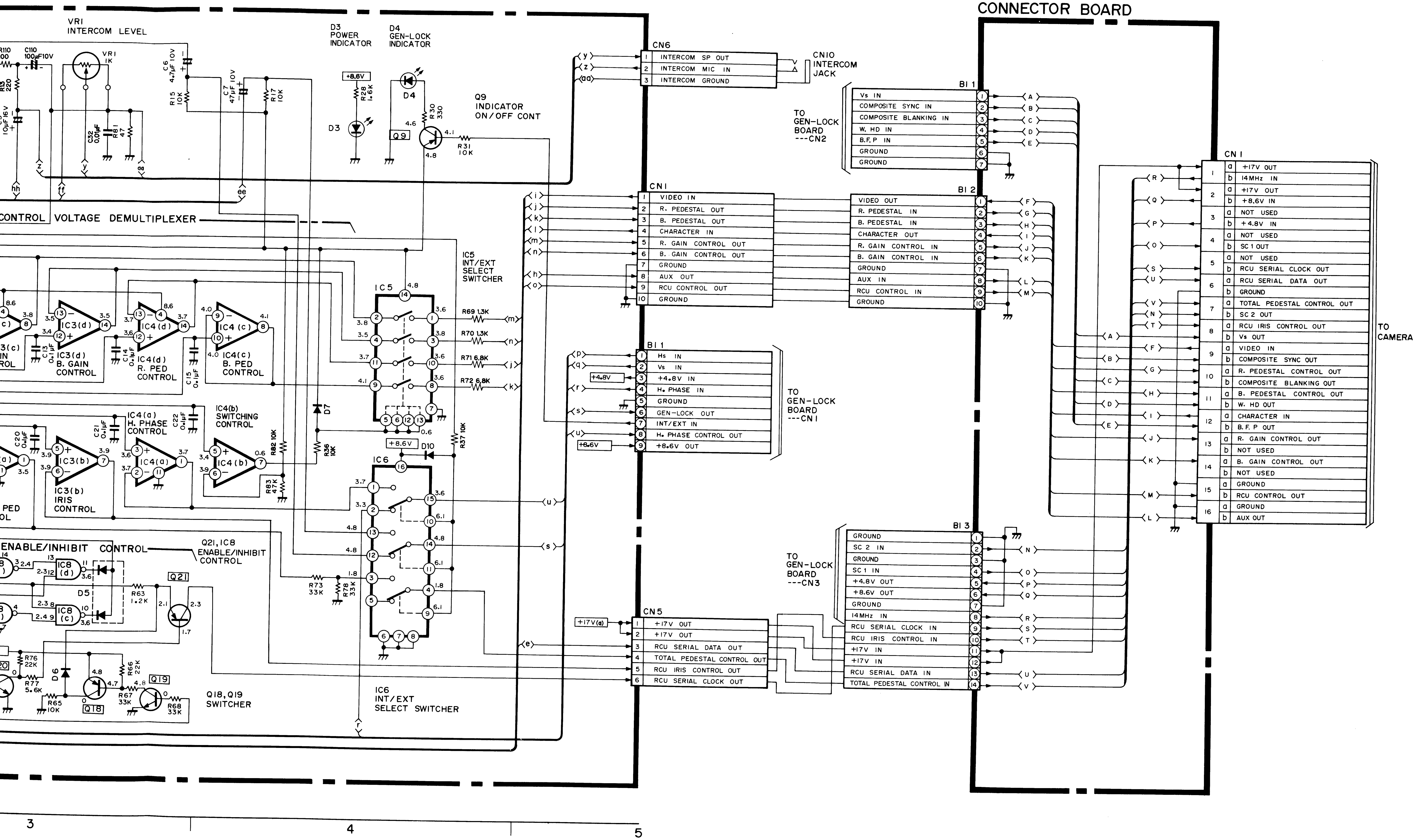
IC1	NJM2904M		D7
IC2	NJU4051BM		B3
IC3	YFNJM064M		B3
IC4	YFNJM064M		B3,4
IC5	MB84066BF		B7
IC6	NJU4053BM		A4,B4
IC7	YFMB84024BF		A3
IC8	YFNJU40118M		A3
Q1	YF2SB953A-PQ		B1
Q2	2SC1318-RS		C2
Q3	2SA1037K7QRS	(F)	C3
Q4	2SD973-QRS		C3
Q9	2SA1037K7QRS	(T)	C4
Q10	2SA1037K7QRS	(P)	B2
Q11	2SC2412K7QRS	(B)	A2
Q13	2SA1022-BC	(F)	A2
Q14	2SC2404-CD	(U)	A2
Q18	2SA1037K7QRS	(T)	A3
Q19	2SC2412K7QRS	(B)	A3
Q20	2SC2412K7QRS	(B)	A3
Q21	2SA1037K7QRS	(F)	A3
Q22	2SC2404-CD	(U)	A2
Q23	2SC2404-CD	(U)	A2
Q24	2SA1037K7QRS	(F)	B2
D1	MA3056HTW		C2
D3	GL-3PR7H		C4
D4	GL-3HY7H		C4
D5	DAP202KT7		A3
D6	MA151K	(MH)	A3
D7	MA151K	(MH)	B4
D8	MA151K	(MH)	B2
D10	MA165		B4


RCU CONTROL BOARD
C
B
A
1
2
3
CN8
GEN-LOCK IN
R001 75
CN2
GEN-LOCK IN
GROUND
+17V
F1 (3A)
+12V REGULATOR
+8.6V DETECTOR
C1 47μF 25V
R1 10K
R4 13K
C100 0.001μF
Q2 REGULATOR OUT
D1 (5.6V)
R5 6.2K
IC1
R7 10K
R103 1K
R8 330
C3 47μF 25V
IC1 +12V REGULATOR
+17V (α)
R9 56
+8.6V
R10 470
R12 1K
R11 1K
Q3
Q4
C4 47μF 16V
Q3,Q4 +8.6V DETECTOR
R110 100
C110 100μF 10V
R13 220
C5 10μF 16V
VR1 INTERCOM LEVEL
VR1 1K
C32 0.01μF
R81 47
C6 4.7μF 10V
R15 10K
C7 47μF 10V
Q1
Q1 +17V POWER SUPPLY
CN7
EMITTER
BASE
COLLECTOR (+17V(α) IN)
RCU DC CONTROL VOLTAGE DEMULTIPLEXER
IC2 ANALOG DEMULTIPLEXER
+4.8V
Q10, Q24 DC BIAS
R86 100K
R87 100K
R85 100K
D8
C10 47μF 10V
C11 0.1μF
R35 22K
Q10
R84 47K
R46 9.1K
R50 75
R32 10K
R33 10K
C9 100μF 10V
C27 0.1μF
IC2
VDD
IC3(c) R. GAIN CONTROL
IC3(d) B. GAIN CONTROL
IC4(d) R. PED CONTROL
IC4(a) H. PHASE CONTROL
IC3(a) TOTAL PED CONTROL
IC3(b) IRIS CONTROL
IC4(b) SWIT CONT
C12 0.1μF
C13 0.1μF
C14 0.1μF
C15 0.1μF
C19 0.1μF
C20 0.1μF
C21 0.1μF
C22 0.1μF
CN3
INTERCOM GROUND
INTERCOM OUT
INTERCOM IN
Q11 INTERCOM AMP
Q11
R100 22K
R101 330
R38 100
C18 100μF 10V
C16 47μF 16V
R40 470
C101 1μF 50V
INCOM AMP
CN4
+17V CONTROL OUT
RCU CHARACTER OUT
SERIAL DATA IN/OUT
GEN-LOCK IN
RCU CONTROL IN
AUX IN
AUX GROUND
VIDEO GROUND
VIDEO OUT
+17V IN
GROUND
R102 270
R39 68
R43 100
R44 10K
R42 2.2K
R79 22K
Q14
Q23
Q13
Q22
C28 1μF 50V
C29 47μF 10V
C30 33PF
R47 22K
R102 10K
R48 47K
VIDEO OUTPUT WHITE AMP
Q13, Q14, Q22, Q23 VIDEO OUTPUT WHITE
C31 68PF
R80 5.6K
CN9
14Pin RCU CONNECTOR
IC7
R64 100K
ENABLE/INHIBIT CONTROL
IC8 (a)
IC8 (b)
IC8 (c)
IC8 (d)
D5
R63 1.2K
Q21
Q21, IC8 ENABLE/ CONTRO
R CLK
IC7 TIMING PULSE GENERATOR
Q20 AMP
Q20
R74 68K
R75 22K
R76 22K
R77 5.6K
D6
R65 10K
Q18
R66 22K
R67 33K
Q19
R68 33K
Q18, Q SWITC

PRODUCT SAFETY NOTE

The shaded area on this schematic diagram incorporates special features important for protection from X-Radiation, fire and electrical shock hazards. When servicing it is essential that only manufacturer's specified parts be used for the critical components in the shaded areas of the schematic.

IC DIAGRAM OF RCU CONTROL BOARD, CONNECTOR BOARD (WV-AD33)

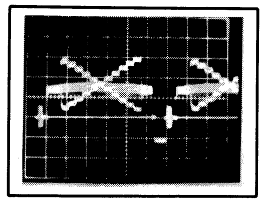


CONNECTOR BOARD
VR1 INTERCOM LEVEL
D3 POWER INDICATOR
D4 GEN-LOCK INDICATOR
Q9 INDICATOR ON/OFF CONT
CONTROL VOLTAGE DEMULTIPLEXER
IC3(d) B. GAIN CONTROL
IC4(d) R. PED CONTROL
IC4(c) B. PED CONTROL
IC4(a) H. PHASE CONTROL
IC4(b) SWITCHING CONTROL
IC3(b) IRIS CONTROL
IC5 INT/EXT SELECT SWITCHER
IC6 INT/EXT SELECT SWITCHER
ENABLE/INHIBIT CONTROL
Q21, IC8 ENABLE/INHIBIT CONTROL
Q18, Q19 SWITCHER
CN6
1 INTERCOM SP OUT
2 INTERCOM MIC IN
3 INTERCOM GROUND
CN10 INTERCOM JACK
CN1
1 VIDEO IN
2 R. PEDESTAL OUT
3 B. PEDESTAL OUT
4 CHARACTER IN
5 R. GAIN CONTROL OUT
6 B. GAIN CONTROL OUT
7 GROUND
8 AUX OUT
9 RCU CONTROL OUT
10 GROUND
BI 1
1 Hs IN
2 Vs IN
3 +4.8V IN
4 H. PHASE IN
5 GROUND
6 GEN-LOCK OUT
7 INT/EXT IN
8 H. PHASE CONTROL OUT
9 +8.6V OUT
TO GEN-LOCK BOARD ---CN1
CN5
1 +17V OUT
2 +17V OUT
3 RCU SERIAL DATA OUT
4 TOTAL PEDESTAL CONTROL OUT
5 RCU IRIS CONTROL OUT
6 RCU SERIAL CLOCK OUT
TO GEN-LOCK BOARD ---CN2
BI 1
1 Vs IN
2 COMPOSITE SYNC IN
3 COMPOSITE BLANKING IN
4 W. HD IN
5 B.F.P IN
6 GROUND
7 GROUND
BI 2
1 VIDEO OUT
2 R. PEDESTAL IN
3 B. PEDESTAL IN
4 CHARACTER OUT
5 R. GAIN CONTROL IN
6 B. GAIN CONTROL IN
7 GROUND
8 AUX IN
9 RCU CONTROL IN
10 GROUND
TO GEN-LOCK BOARD ---CN3
BI 3
1 GROUND
2 SC 2 IN
3 GROUND
4 SC 1 IN
5 +4.8V OUT
6 +8.6V OUT
7 GROUND
8 14MHz IN
9 RCU SERIAL CLOCK IN
10 RCU IRIS CONTROL IN
11 +17V IN
12 +17V IN
13 RCU SERIAL DATA IN
14 TOTAL PEDESTAL CONTROL IN
CN1
1 a +17V OUT
1 b 14MHz IN
2 a +17V OUT
2 b +8.6V IN
3 a NOT USED
3 b +4.8V IN
4 a NOT USED
4 b SC 1 OUT
5 a NOT USED
5 b RCU SERIAL CLOCK OUT
6 a RCU SERIAL DATA OUT
6 b GROUND
7 a TOTAL PEDESTAL CONTROL OUT
7 b SC 2 OUT
8 a RCU IRIS CONTROL OUT
8 b Vs OUT
9 a VIDEO IN
9 b COMPOSITE SYNC OUT
10 a R. PEDESTAL CONTROL OUT
10 b COMPOSITE BLANKING OUT
11 a B. PEDESTAL CONTROL OUT
11 b W. HD OUT
12 a CHARACTER IN
12 b B.F.P OUT
13 a R. GAIN CONTROL OUT
13 b NOT USED
14 a B. GAIN CONTROL OUT
14 b NOT USED
15 a GROUND
15 b RCU CONTROL OUT
16 a GROUND
16 b AUX OUT
TO CAMERA
3
4
5

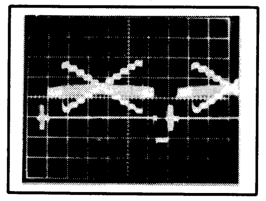
VIDEO BOARD

IC1	HD14001BP	A7,C2
IC2	YFHD14538BP	C3
IC3	NJM3414D	B7
IC4	NJM2048MC	C8
IC5	NJM4558DFD	D6
IC7	YFM84051	B7
IC8	MB84024	B4
IC9	MB84021	B3
IC10	MB84021	B3
IC11	YFNJM386D	D8
IC12	YFNJM319D	B5
Q1	2SC828-QRS	C2
Q2	2SA838-BC	C2
Q3	2SC828-QRS	C3
Q4	2SC828-QRS	C3
Q5	2SC828-QRS	D3
Q6	2SC641K-C	C4
Q13	2SC828-QRS	C4
Q14	2SC1383	C4
Q15	2SA683-PQ	C4
Q16	2SC1317-RS	A6
Q17	2SB929-PQ	C9
Q20	2SC1383	C7
Q21	2SC828-QRS	D7
Q22	2SC828-QRS	D7
Q23	2SC828-QRS	D8
Q24	2SC828-QRS	D8
Q25	2SC1383	D9
Q26	2SA683-PQ	D9
Q27	2SC1047-CD	B6
Q28	2SC828-QRS	A6
Q29	2SC1047-CD	B6
Q30	2SC828-QRS	A6
Q31	2SC1047-CD	B6
Q34	2SC1047-CD	B7
Q35	2SC1047-CD	B7
Q36	2SA564-QRS	B7
Q37	2SA564-QRS	B7
Q38	2SA564-QRS	B8
Q39	2SA838-BC	B8
Q40	2SA838-BC	B8
Q41	2SA838-BC	B7
Q42	2SC1047-CD	B8
Q43	2SC1047-CD	B8
Q44	2SC828-QRS	B8
Q45	2SC828-QRS	A4
Q48	2SA838-BC	A4
Q49	2SC1047-CD	A4
Q50	2SC1047-CD	A4
Q51	2SA838-BC	A4
Q55	2SC828-QRS	B3
Q56	2SC828-QRS	B9
Q57	2SA564-QRS	B9
Q58	2SA564-QRS	B9
Q59	2SC828-QRS	B9
Q60	2SC828-QRS	B9
Q61	2SC828-QRS	B9
Q62	2SC828-QRS	B9
Q63	2SC1327-RS	B4,C4
Q64	2SA721-RS	B4
Q65	2SC828-QRS	B3,C3
Q66	2SA564-QRS	C3
Q67	2SA564-QRS	D9
Q68	2SA838-BC	B5
D1	MA165	C4
D2	MA165	C4
D3	MA165	A6
D4	MA165	A6
D5	EK14	C9
D6	MA165	D8
D7	MA165	D8
D8	MA165	A6
D9	MA165	D7
D10	MA165	D6

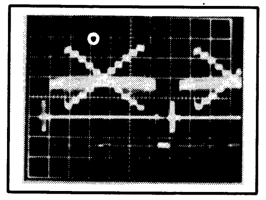
1. 0.2V/DIV, 10μs/DIV



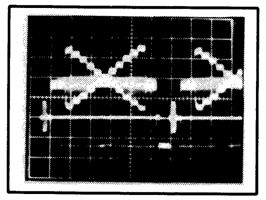
2. 0.5/DIV, 10μs/DIV



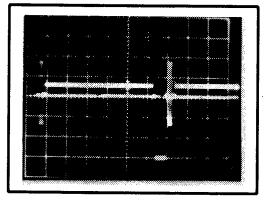
3. 0.5V/DIV, 10μs/DIV



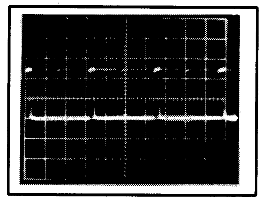
4. 0.5V/DIV, 10μs/DIV



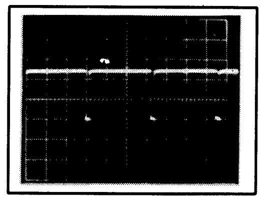
5. 0.2V/DIV, 10μs/DIV



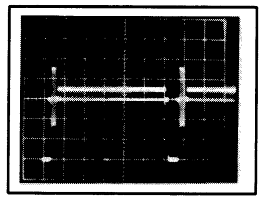
6. 0.1V/DIV, 10μs/DIV



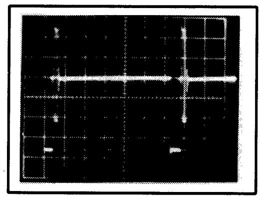
7. 5V/DIV, 20μs/DIV



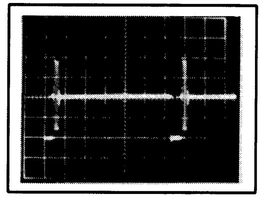
8. 0.2V/DIV, 10μs/DIV



9. 0.2V/DIV, 10μs/DIV



10. 0.2V/DIV, 10μs/DIV



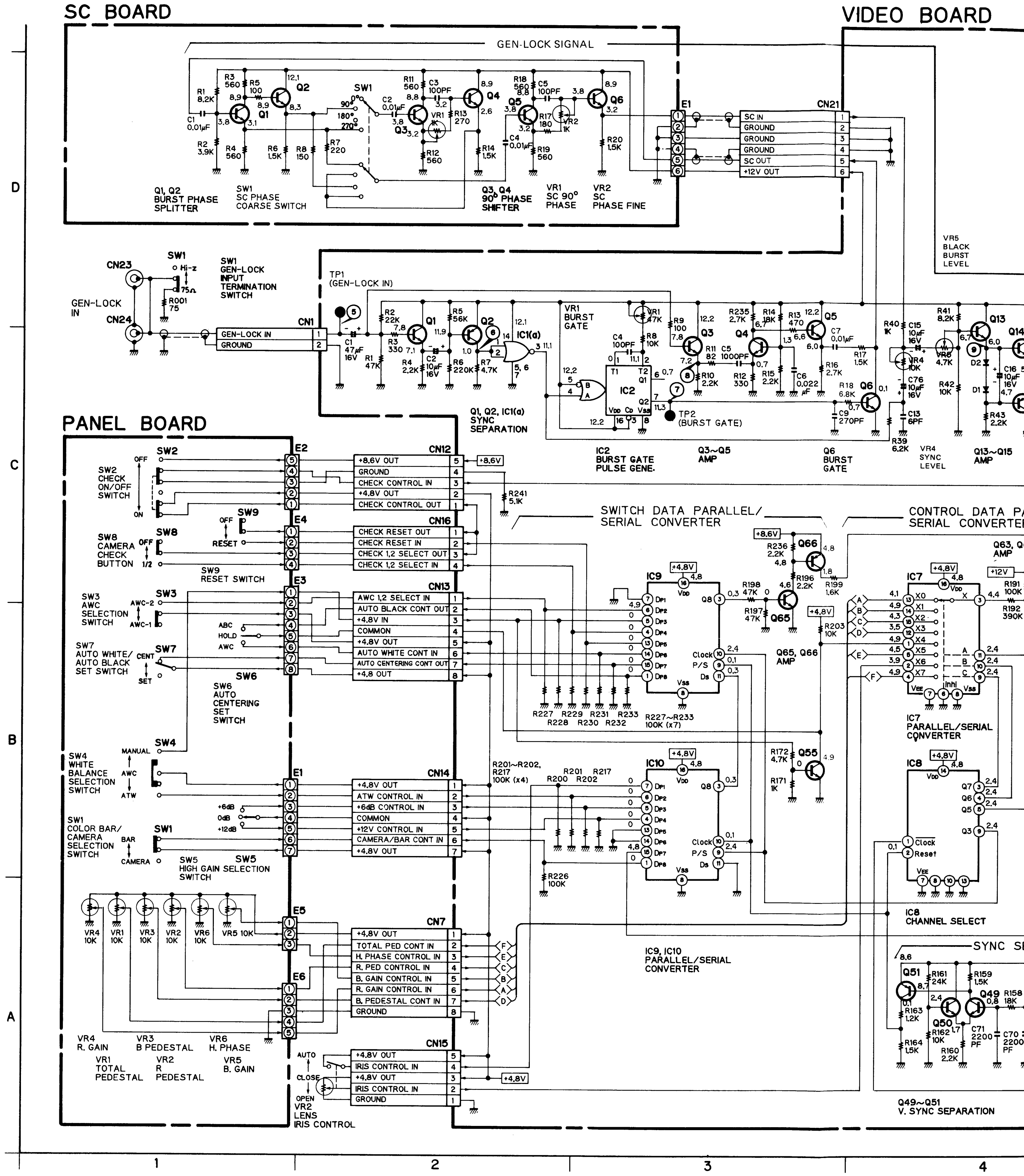
SC BOARD

Q1	2SC828-QRS	D1
Q2	2SC828-QRS	D1
Q3	2SC828-QRS	D2
Q4	2SC828-QRS	D2
Q5	2SC828-QRS	D2
Q6	2SC828-QRS	D3

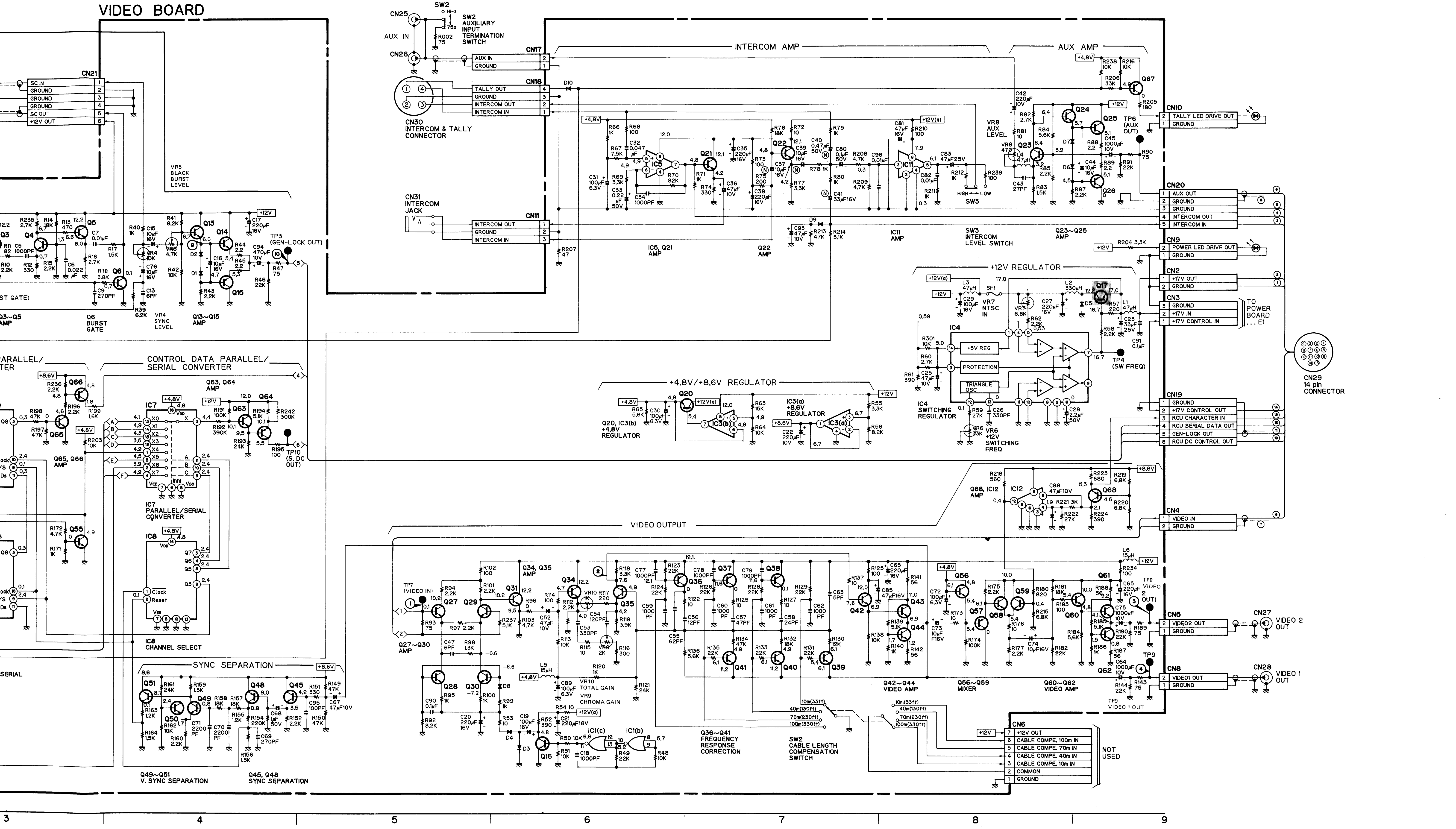
PRODUCT SAFETY NOTE

The shaded area on this schematic diagram incorporates special features important for protection from X-Radiation, fire and electrical shock hazards. When servicing it is essential that only manufacturer's specified parts be used for the critical components in the shaded areas of the schematic.

SCHEMATIC DIAGRA


SC BOARD
VIDEO BOARD
PANEL BOARD
GEN-LOCK SIGNAL
Q1, Q2 BURST PHASE SPLITTER
SW1 SC PHASE COARSE SWITCH
Q3, Q4 90° PHASE SHIFTER
VR1 SC 90° PHASE
VR2 SC PHASE FINE
SC IN
GROUND
SC OUT
+12V OUT
CN21
E1
CN23
CN24
GEN-LOCK IN
SW1 GEN-LOCK INPUT TERMINATION SWITCH
CN1
TP1 (GEN-LOCK IN)
VR1 BURST GATE
Q1, Q2, IC1(a) SYNC SEPARATION
IC2 BURST GATE PULSE GENE.
TP2 (BURST GATE)
Q3~Q5 AMP
Q6 BURST GATE
VR4 SYNC LEVEL
Q13~Q15 AMP
VR5 BLACK BURST LEVEL
SWITCH DATA PARALLEL/SERIAL CONVERTER
CONTROL DATA PA SERIAL CONVERTEI
Q65, Q66 AMP
Q63, Q AMP
IC7 PARALLEL/SERIAL CONVERTER
IC8 CHANNEL SELECT
IC9, IC10 PARALLEL/SERIAL CONVERTER
SYNC SE
Q49~Q51 V. SYNC SEPARATION
SW2 CHECK ON/OFF SWITCH
SW8 CAMERA CHECK BUTTON
SW9 RESET SWITCH
SW3 AWC SELECTION SWITCH
SW7 AUTO WHITE/AUTO BLACK SET SWITCH
SW6 AUTO CENTERING SET SWITCH
SW4 WHITE BALANCE SELECTION SWITCH
SW1 COLOR BAR/CAMERA SELECTION SWITCH
SW5 HIGH GAIN SELECTION SWITCH
VR4 R. GAIN
VR3 B PEDESTAL
VR6 H. PHASE
VR1 TOTAL PEDESTAL
VR2 R PEDESTAL
VR5 B. GAIN
VR2 LENS IRIS CONTROL
CN12
+8.6V OUT
GROUND
CHECK CONTROL IN
+4.8V OUT
CHECK CONTROL OUT
CN16
CHECK RESET OUT
CHECK RESET IN
CHECK 1,2 SELECT OUT
CHECK 1,2 SELECT IN
CN13
AWC 1,2 SELECT IN
AUTO BLACK CONT OUT
+4.8V IN
COMMON
+4.8V OUT
AUTO WHITE CONT IN
AUTO CENTERING CONT OUT
+4.8 OUT
CN14
+4.8V OUT
ATW CONTROL IN
+6dB CONTROL IN
COMMON
+12V CONTROL IN
CAMERA/BAR CONT IN
+4.8V OUT
CN7
+4.8V OUT
TOTAL PED CONT IN
H. PHASE CONTROL IN
R. PED CONTROL IN
B. GAIN CONTROL IN
R. GAIN CONTROL IN
B. PEDESTAL CONT IN
GROUND
CN15
+4.8V OUT
IRIS CONTROL IN
+4.8V OUT
IRIS CONTROL IN
GROUND
E2
E3
E4
E5
E6
D
C
B
A
1
2
3
4

SCHEMATIC DIAGRAM OF VIDEO BOARD, PANEL BOARD, SC BOARD (WV-RC33)

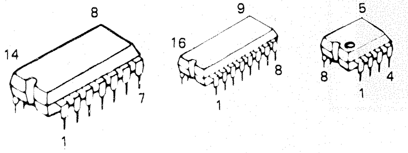

VIDEO BOARD
CN21
SC IN
GROUND
SC OUT
+12V OUT
VR5 BLACK BURST LEVEL
TP3 (GEN-LOCK OUT)
Q6 BURST GATE
VR4 SYNC LEVEL
Q13~Q15 AMP
CONTROL DATA PARALLEL/ SERIAL CONVERTER
Q63, Q64 AMP
TP10 (S. DC OUT)
Q65, Q66 AMP
IC7 PARALLEL/SERIAL CONVERTER
IC8 CHANNEL SELECT
SYNC SEPARATION
Q49~Q51 V. SYNC SEPARATION
Q45, Q48 SYNC SEPARATION
CN25
SW2
AUX IN
CN26
SW2 AUXILIARY INPUT TERMINATION SWITCH
CN17
AUX IN
GROUND
CN18
TALLY OUT
INTERCOM OUT
INTERCOM IN
CN30 INTERCOM & TALLY CONNECTOR
CN31 INTERCOM JACK
CN11
INTERCOM AMP
IC5, Q21 AMP
Q22 AMP
IC11 AMP
SW3 INTERCOM LEVEL SWITCH
HIGH ← → LOW
SW3
AUX AMP
VR8 AUX LEVEL
Q23~Q25 AMP
TP6 (AUX OUT)
CN10
TALLY LED DRIVE OUT
CN20
AUX OUT
CN9
POWER LED DRIVE OUT
+12V REGULATOR
VR7 NTSC IN
IC4
+5V REG
PROTECTION
TRIANGLE OSC
IC4 SWITCHING REGULATOR
VR6 +12V SWITCHING FREQ
TP4 (SW FREQ)
CN2
+17V OUT
CN3
+17V IN
+17V CONTROL IN
TO POWER BOARD ... E1
CN29 14 pin CONNECTOR
+4.8V/+8.6V REGULATOR
Q20, IC3(b) +4.8V REGULATOR
IC3(a) +8.6V REGULATOR
CN19
+17V CONTROL OUT
RCU CHARACTER IN
RCU SERIAL DATA OUT
GEN-LOCK OUT
RCU DC CONTROL OUT
Q68, IC12 AMP
CN4
VIDEO IN
VIDEO OUTPUT
TP7 (VIDEO IN)
Q27~Q30 AMP
Q34, Q35 AMP
VR10 TOTAL GAIN
VR9 CHROMA GAIN
Q36~Q41 FREQUENCY RESPONSE CORRECTION
SW2 CABLE LENGTH COMPENSATION SWITCH
10m(33ft)
40m(130ft)
70m(230ft)
100m(330ft)
Q42~Q44 VIDEO AMP
Q56~Q59 MIXER
Q60~Q62 VIDEO AMP
TP8 VIDEO 2 OUT
TP9 VIDEO 1 OUT
CN5
VIDEO2 OUT
CN27 VIDEO 2 OUT
CN8
VIDEO1 OUT
CN28 VIDEO 1 OUT
CN6
+12V OUT
CABLE COMPE. 100m IN
CABLE COMPE. 70m IN
CABLE COMPE. 40m IN
CABLE COMPE. 10m IN
COMMON
NOT USED
3
4
5
6
7
8
9

CONDUCTOR VIEW OF VIDEO BOARD, PANEL

NJM319D
HD14001BP
NJM2048MC
MB84024

HD14538BP
MB84051
MB84021

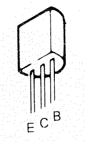
NJM3414D
NJM4558DFD
NJM386D



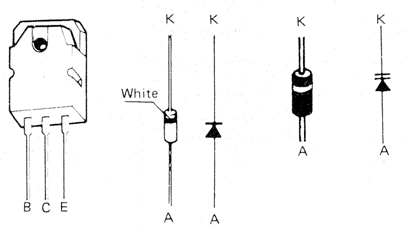
8
14
7
1
9
16
8
1
5
8
4
1

2SA838-BC
2SC828-QRS
2SC1383-QRS
2SA564-QRS
2SA683-QRS

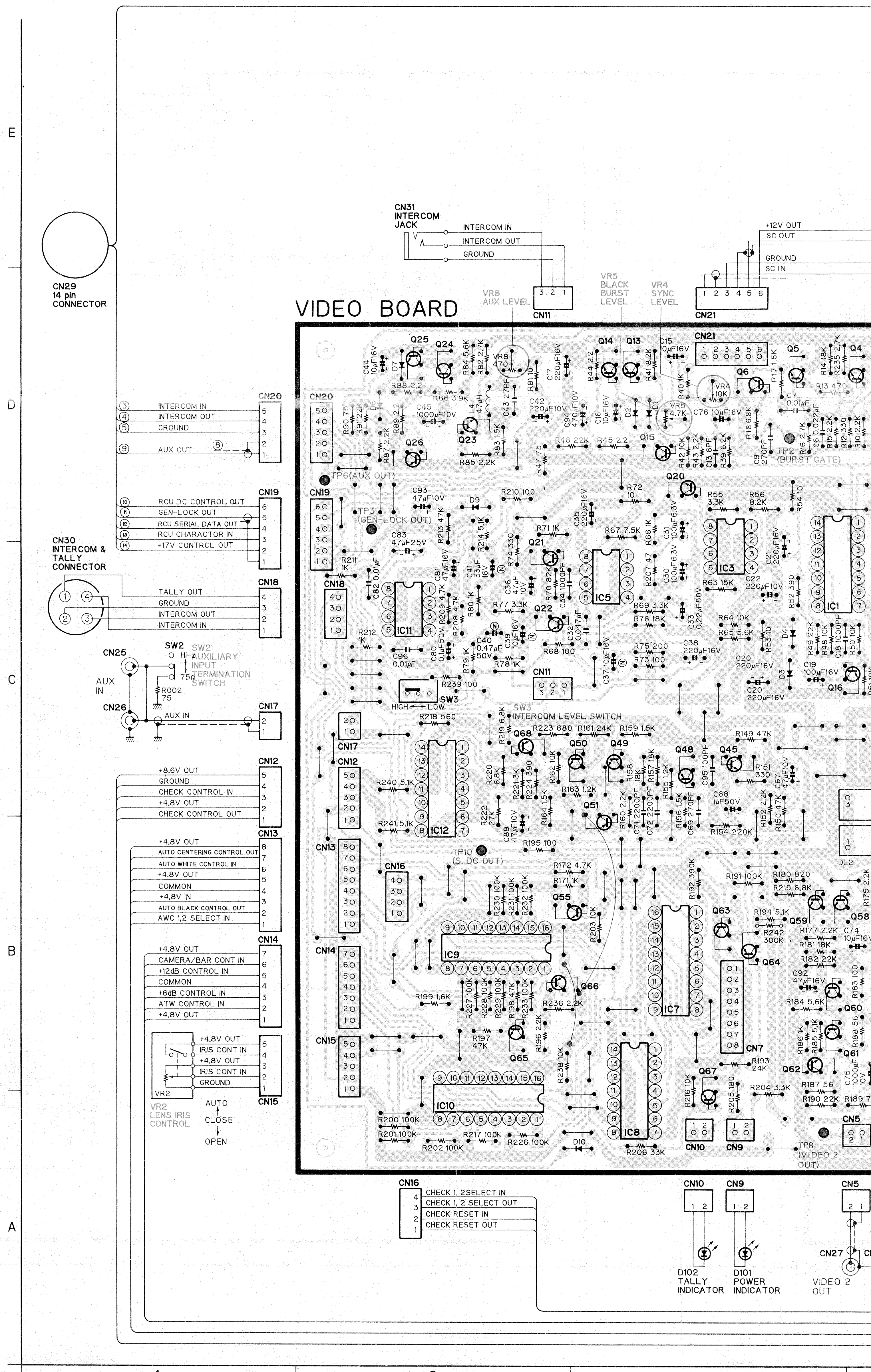
2SC1317-RS
2SC-1047-CD
2SC641K-C
2SA721



2SB929 MA165 EK14



White
K
K
K
K
A
A
B C E
A
A



VIDEO BOARD
E
D
C
B
A
1
2
3
CN29
14 pin
CONNECTOR
CN30
INTERCOM &
TALLY
CONNECTOR
CN31
INTERCOM
JACK
INTERCOM IN
INTERCOM OUT
GROUND
CN11
VR8
AUX LEVEL
VR5
BLACK
BURST
LEVEL
VR4
SYNC
LEVEL
CN21
+12V OUT
SC OUT
GROUND
SC IN
CN20
INTERCOM IN
INTERCOM OUT
GROUND
AUX OUT
CN19
RCU DC CONTROL OUT
GEN-LOCK OUT
RCU SERIAL DATA OUT
RCU CHARACTOR IN
+17V CONTROL OUT
CN18
TALLY OUT
GROUND
INTERCOM OUT
INTERCOM IN
CN25
CN26
AUX
IN
SW2
AUXILIARY
INPUT
TERMINATION
SWITCH
R002
75
CN17
AUX IN
CN12
+8.6V OUT
GROUND
CHECK CONTROL IN
+4.8V OUT
CHECK CONTROL OUT
CN13
+4.8V OUT
AUTO CENTERING CONTROL OUT
AUTO WHITE CONTROL IN
+4.8V OUT
COMMON
+4.8V IN
AUTO BLACK CONTROL OUT
AWC 1,2 SELECT IN
CN14
+4.8V OUT
CAMERA/BAR CONT IN
+12dB CONTROL IN
COMMON
+6dB CONTROL IN
ATW CONTROL IN
+4.8V OUT
CN15
+4.8V OUT
IRIS CONT IN
+4.8V OUT
IRIS CONT IN
GROUND
VR2
VR2
LENS IRIS
CONTROL
AUTO
CLOSE
OPEN
CN16
CHECK 1, 2SELECT IN
CHECK 1, 2 SELECT OUT
CHECK RESET IN
CHECK RESET OUT
CN10
CN9
CN5
D102
TALLY
INDICATOR
D101
POWER
INDICATOR
CN27
VIDEO 2
OUT
TP6(AUX OUT)
TP3
(GEN-LOCK OUT)
TP2
(BURST GATE)
TP10
(S. DC OUT)
TP8
(VIDEO 2
OUT)
SW3
HIGH LOW
SW3
INTERCOM LEVEL SWITCH
IC1
IC3
IC5
IC7
IC8
IC9
IC10
IC11
IC12
DL2
CN7
Q4
Q5
Q6
Q13
Q14
Q15
Q16
Q20
Q21
Q22
Q23
Q24
Q25
Q26
Q45
Q48
Q49
Q50
Q51
Q55
Q58
Q59
Q60
Q61
Q62
Q63
Q64
Q65
Q66
Q67
Q68

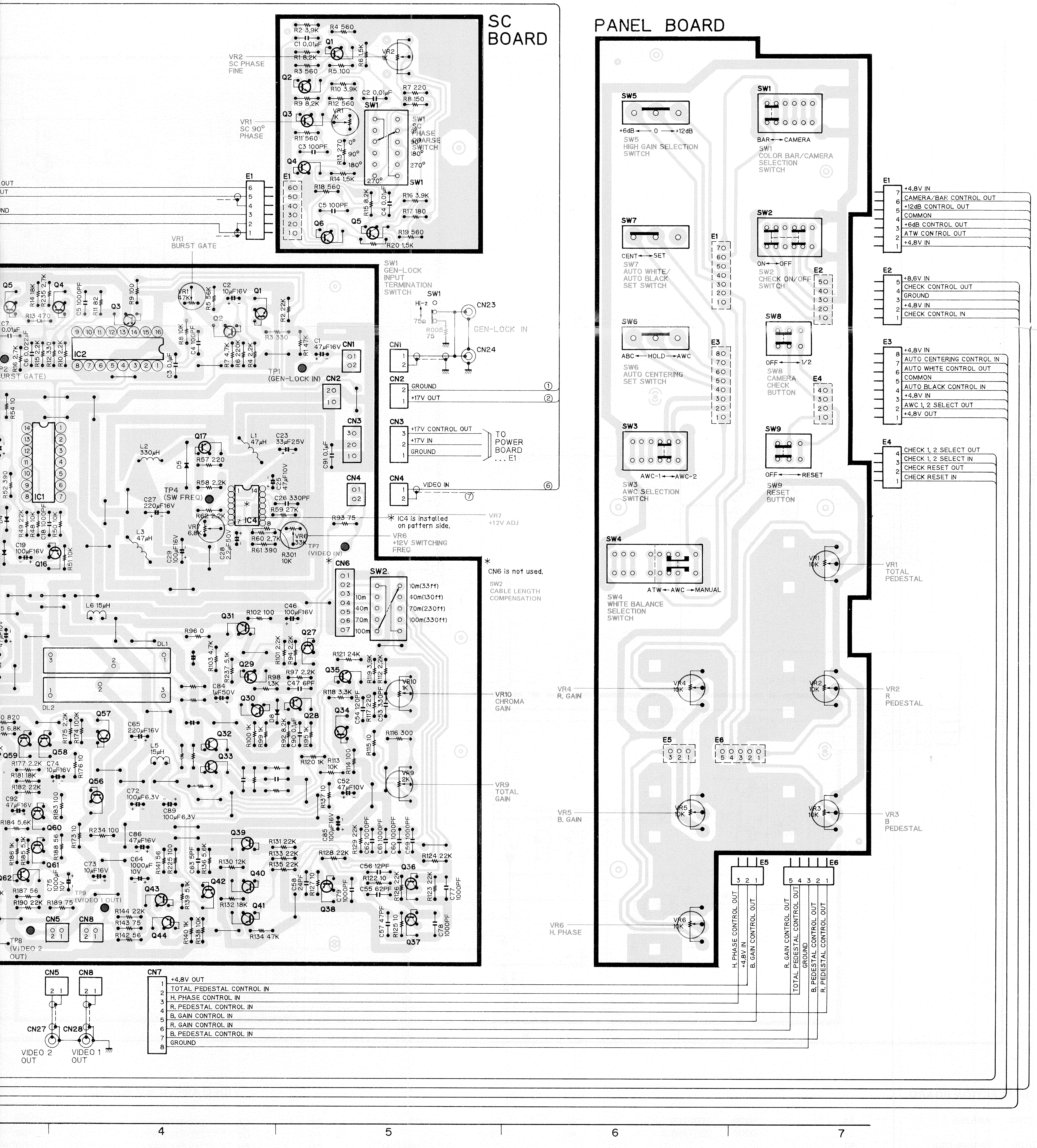
VIDEO BOARD

IC1	HD14001BP	C3,D3
IC2	YFHD14538BP	D4
IC3	NJM3414D	C3,D3
IC4	NJM2048MC	C4
IC5	NJM4558DFD	C3
IC7	YFM84051	B3
IC8	MB84024	A3,B3
IC9	MB84021	B2
IC10	MB84021	A2
IC11	YFNJM386D	C2
IC12	YFNJM319D	C2
Q1	2SC828-QRS	D3
Q2	2SA838-BC	D2
Q3	2SC828-QRS	D4
Q4	2SC828-QRS	D4
Q5	2SC828-QRS	D3
Q6	2SC641K-C	D3
Q13	2SC828-QRS	D3
Q14	2SC1383	D3
Q15	2SA683-PQ	D3
Q16	2SC1317-RS	C4
Q17	2SB929-PQ	C4,D4
Q20	2SC1383	D3
Q21	2SC828-QRS	C2
Q22	2SC828-QRS	C2
Q23	2SC828-QRS	D2
Q24	2SC828-QRS	D2
Q25	2SC1383	D2
Q26	2SA683-PQ	D2
Q27	2SC1047-CD	C5
Q28	2SC828-QRS	B5
Q29	2SC1047-CD	B4
Q30	2SC828-QRS	B4
Q31	2SC1047-CD	C4
Q34	2SC1047-CD	B5
Q35	2SC1047-CD	B5
Q36	2SA564-QRS	B5
Q37	2SA564-QRS	A5
Q38	2SA564-QRS	B5
Q39	2SA838-BC	B4
Q40	2SA838-BC	B4
Q41	2SA838-BC	A4
Q42	2SC1047-CD	B4
Q43	2SC1047-CD	A4
Q44	2SC828-QRS	A4
Q45	2SC828-QRS	C3
Q48	2SA838-BC	C3
Q49	2SC1047-CD	C3
Q50	2SC1047-CD	C2,C3
Q51	2SA838-BC	B3
Q55	2SC828-QRS	B2
Q56	2SC828-QRS	B4
Q57	2SA564-QRS	B4
Q58	2SA564-QRS	B3
Q59	2SC828-QRS	B3
Q60	2SC828-QRS	B3
Q61	2SC828-QRS	B3
Q62	2SC828-QRS	B3
Q63	2SC1327-RS	B3
Q64	2SA721-RS	B3
Q65	2SC828-QRS	B2
Q66	2SA564-QRS	B3
Q67	2SA564-QRS	A3
Q68	2SA838-BC	C2
D1	MA165	D3
D2	MA165	D3
D3	MA165	C3
D4	MA165	C3
D5	EK14	C4
D6	MA165	D2
D7	MA165	D2
D8	MA165	B5
D9	MA165	D2
D10	MA165	A3

SC BOARD

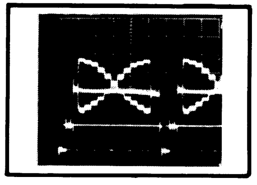
Q1	2SC828-QRS	E5
Q2	2SC828-QRS	E5
Q3	2SC828-QRS	E5
Q4	2SC828-QRS	E5
Q5	2SC828-QRS	D5
Q6	2SC828-QRS	D5

PANEL BOARD, SC BOARD (WV-RC33)

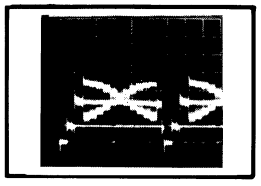

SC BOARD
PANEL BOARD
VR2 SC PHASE FINE
VR1 SC 90° PHASE
SW1 SC PHASE COARSE SWITCH
0° 90° 180° 270°
VR1 BURST GATE
SW1 GEN-LOCK INPUT TERMINATION SWITCH
Hi-z
75Ω
CN23
CN24
GEN-LOCK IN
TP1 (GEN-LOCK IN)
TP2 (BURST GATE)
TP4 (SW FREQ)
TP7 (VIDEO IN)
TP8 (VIDEO 2 OUT)
TP9 (VIDEO 1 OUT)
IC1
IC2
IC4
* IC4 is installed on pattern side.
* CN6 is not used.
VR7 +12V ADJ
VR6 +12V SWITCHING FREQ
CN1
CN2 GROUND
+17V OUT
CN3 +17V CONTROL OUT
+17V IN
GROUND
TO POWER BOARD ... E1
CN4 VIDEO IN
SW2 CABLE LENGTH COMPENSATION
10m(33ft)
40m(130ft)
70m(230ft)
100m(330ft)
DL1
DL2
VR10 CHROMA GAIN
VR9 TOTAL GAIN
CN5
CN8
CN27
CN28
VIDEO 2 OUT
VIDEO 1 OUT
CN7
+4.8V OUT
TOTAL PEDESTAL CONTROL IN
H. PHASE CONTROL IN
R. PEDESTAL CONTROL IN
B. GAIN CONTROL IN
R. GAIN CONTROL IN
B. PEDESTAL CONTROL IN
GROUND
SW5
+6dB ← 0 → +12dB
SW5 HIGH GAIN SELECTION SWITCH
SW1
BAR ← → CAMERA
SW1 COLOR BAR/CAMERA SELECTION SWITCH
SW7
CENT ← → SET
SW7 AUTO WHITE/AUTO BLACK SET SWITCH
SW2
ON ← → OFF
SW2 CHECK ON/OFF SWITCH
SW6
ABC ← HOLD → AWC
SW6 AUTO CENTERING SET SWITCH
SW8
OFF ← → 1/2
SW8 CAMERA CHECK BUTTON
SW3
AWC-1 ← → AWC-2
SW3 AWC SELECTION SWITCH
SW9
OFF ← → RESET
SW9 RESET BUTTON
SW4
ATW ← AWC → MANUAL
SW4 WHITE BALANCE SELECTION SWITCH
VR1 TOTAL PEDESTAL
VR4 R. GAIN
VR2 R PEDESTAL
VR5 B. GAIN
VR3 B PEDESTAL
VR6 H. PHASE
E1
+4.8V IN
CAMERA/BAR CONTROL OUT
+12dB CONTROL OUT
COMMON
+6dB CONTROL OUT
ATW CONTROL OUT
+4.8V IN
E2
+8.6V IN
CHECK CONTROL OUT
GROUND
+4.8V IN
CHECK CONTROL IN
E3
+4.8V IN
AUTO CENTERING CONTROL IN
AUTO WHITE CONTROL OUT
COMMON
AUTO BLACK CONTROL IN
+4.8V IN
AWC 1, 2 SELECT OUT
+4.8V OUT
E4
CHECK 1, 2 SELECT OUT
CHECK 1, 2 SELECT IN
CHECK RESET OUT
CHECK RESET IN
E5
H. PHASE CONTROL OUT
+4.8V IN
B. GAIN CONTROL OUT
E6
R. GAIN CONTROL OUT
TOTAL PEDESTAL CONTROL OUT
GROUND
B. PEDESTAL CONTROL OUT
R. PEDESTAL CONTROL OUT
4
5
6
7

SCHEMATIC DIAGRAM OF 5″ VIE

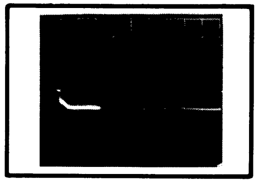
1 0.2V/DIV, 10μs/DIV



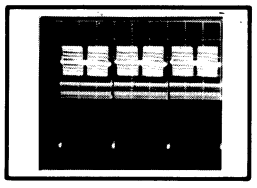
2 0.1V/DIV, 10μs/DIV



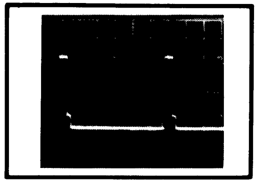
3 0.5V/DIV, 5ms/DIV



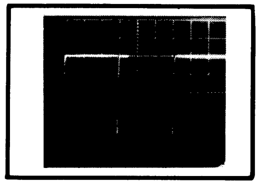
4 0.5V/DIV, 5ms/DIV



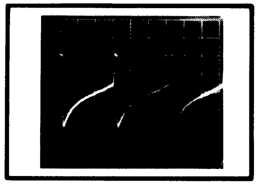
5 2V/DIV, 10μs/DIV



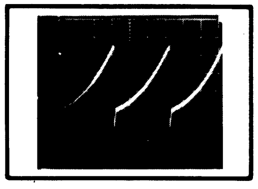
6 2V/DIV, 5ms/DIV



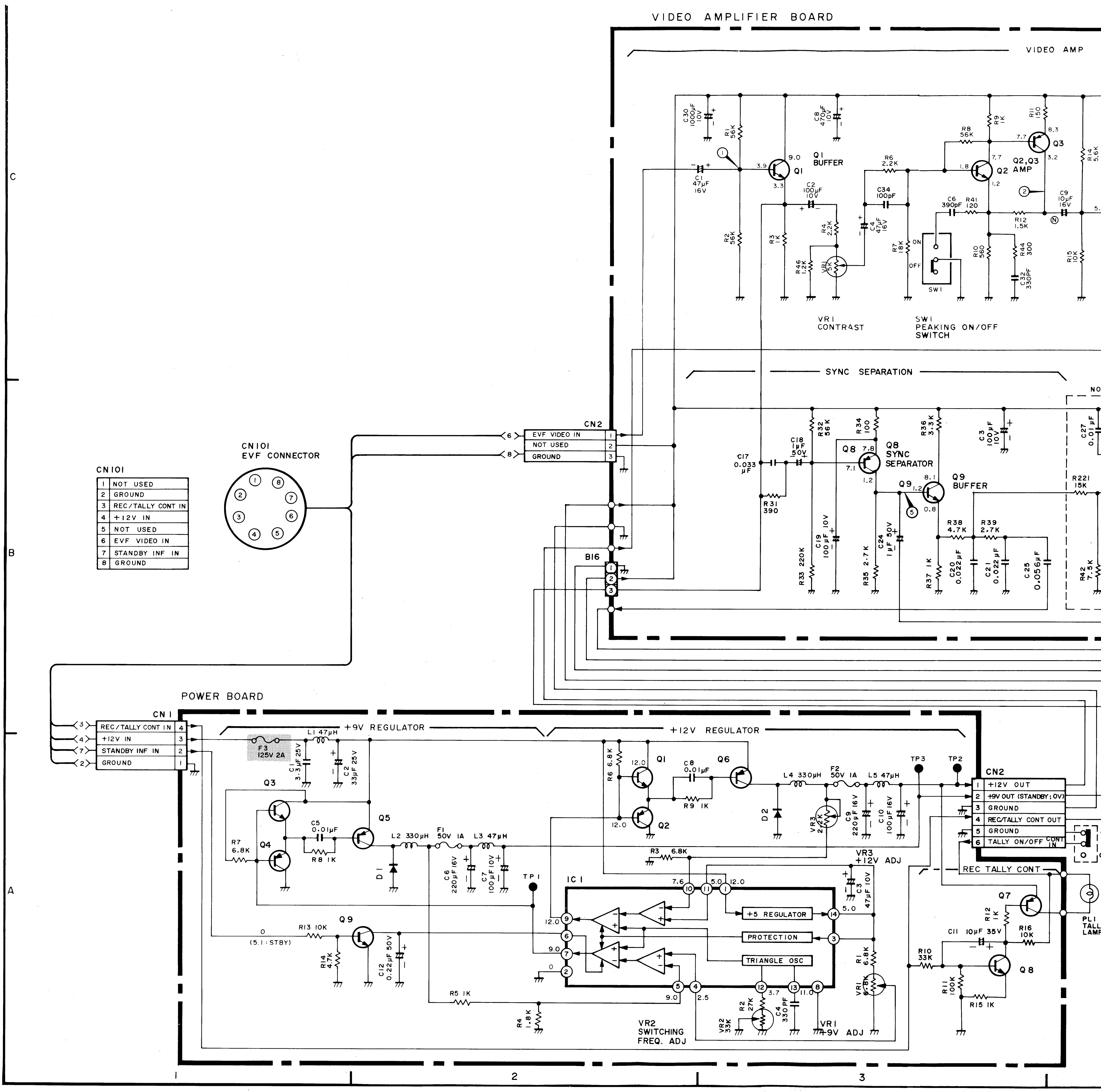
7 0.2V/DIV, 5ms/DIV



8 0.05V/DIV, 5ms/DIV



9


VIDEO AMPLIFIER BOARD
VIDEO AMP
Q1 BUFFER
Q2,Q3 AMP
VR1 CONTRAST
SW1 PEAKING ON/OFF SWITCH
SYNC SEPARATION
Q8 SYNC SEPARATOR
Q9 BUFFER
CN2
EVF VIDEO IN
NOT USED
GROUND
CN101 EVF CONNECTOR
CN101
1 NOT USED
2 GROUND
3 REC/TALLY CONT IN
4 +12V IN
5 NOT USED
6 EVF VIDEO IN
7 STANDBY INF IN
8 GROUND
B16
POWER BOARD
CN1
REC/TALLY CONT IN
+12V IN
STANDBY INF IN
GROUND
+9V REGULATOR
+12V REGULATOR
F3 125V 2A
F1 50V 1A
F2 50V 1A
TP1
TP2
TP3
IC1
+5 REGULATOR
PROTECTION
TRIANGLE OSC
VR2 SWITCHING FREQ. ADJ
VR1 +9V ADJ
VR3 +12V ADJ
CN2
1 +12V OUT
2 +9V OUT (STANDBY: 0V)
3 GROUND
4 REC/TALLY CONT OUT
5 GROUND
6 TALLY ON/OFF CONT IN
REC TALLY CONT
PL1 TALLY LAMP
A
B
C
1
2
3

DEFLECTION BOARD

C202	AN5750	A5
100	2SD636-QRS	B5
101	2SB641-QRS	B5
102	2SD636-QRS	B5
103	2SC1226-QR	B6
104	2SA684-QR	B6
		B4
		B5

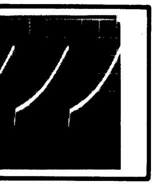
Q206	2SD772B	A6
Q207	2SD1205-R	A3
D100	MA161	B5
D101	MA161	B5
D102	MA165	B5
D206	YUDX068	A5
D207	YUDERB24-04C	A6

D208	YUDU06C	A6
D209	OA91	A6
D210	YUDERB24-04C	A6
D211	YUDERB24-04C	A6
D212	YUDERB24-04C	A6
D213	YUDERB24-04C	A6
D214	LN23L	A4

VIDEO AMPLIFIER BOARD

Q1	2SD636-QRS	C3	D1
Q2	2SD636-QRS	C3	D2
Q3	2SB641-QRS	C3	D3
Q4	2SD636-QRS	C4	D4
Q5	2SC1216-FS	C4	D5
Q6	2SC2258QRS	C4	
Q7	2SA1018A	C4	
Q8	2SB641-QRS	B3	
Q9	2SD636-QRS	B3	
Q10	2SD661-TU	B3	

5″ VIEWFINDER FOR WV-VF65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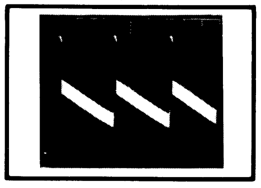
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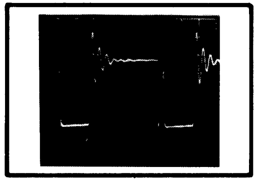
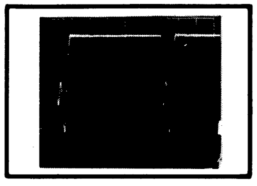
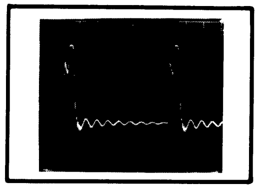
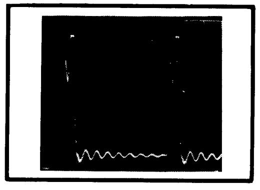
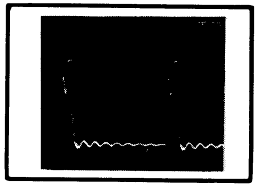
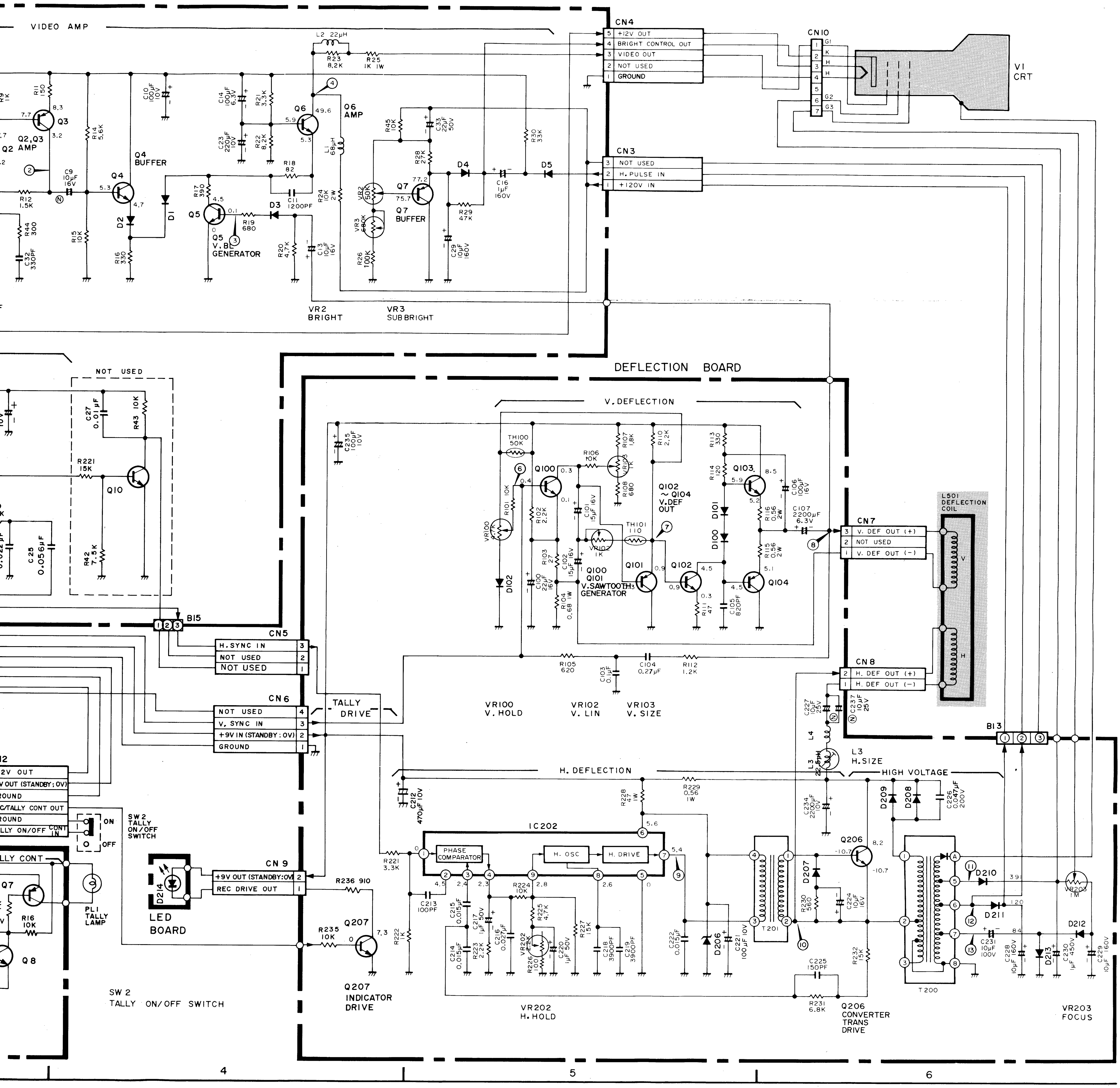

10 2V/DIV, 10μs/DIV


11 20V/DIV, 10μs/DIV


12 100V/DIV, 10μs/DIV


13 20V/DIV, 10μs/DIV


14 20V/DIV, 10μs/DIV


VIDEO AMP
CN4
5 +12V OUT
4 BRIGHT CONTROL OUT
3 VIDEO OUT
2 NOT USED
1 GROUND
CN10
G1
K
H
H
G2
G3
V1
CRT
L2 22μH
R23 8.2K
R25 1K 1W
Q6 AMP
Q2,Q3 AMP
Q3
Q4 BUFFER
Q5 V.BL GENERATOR
Q7 BUFFER
VR2 BRIGHT
VR3 SUB BRIGHT
CN3
3 NOT USED
2 H.PULSE IN
1 +120V IN
D1
D2
D3
D4
D5
NOT USED
Q10
R221 15K
R42 7.5K
C27 0.01μF
R43 10K
C25 0.056μF
DEFLECTION BOARD
V.DEFLECTION
Q100
Q101
Q100 Q101 V.SAWTOOTH GENERATOR
Q102 ~ Q104 V.DEF OUT
Q102
Q103
Q104
TH100 50K
TH101 110
VR100 V.HOLD
VR102 V.LIN
VR103 V.SIZE
CN7
3 V. DEF OUT (+)
2 NOT USED
1 V. DEF OUT (−)
L501 DEFLECTION COIL
V
H
CN8
2 H. DEF OUT (+)
1 H. DEF OUT (−)
B15
CN5
3 H.SYNC IN
2 NOT USED
1 NOT USED
CN6
4 NOT USED
3 V. SYNC IN
2 +9V IN (STANDBY: OV)
1 GROUND
TALLY DRIVE
2V OUT
V OUT (STANDBY: OV)
ROUND
C/TALLY CONT OUT
ROUND
LLY ON/OFF
CONT IN
SW2 TALLY ON/OFF SWITCH
ON
OFF
LLY CONT
Q7
Q8
PL1 TALLY LAMP
D214
LED BOARD
CN9
2 +9V OUT (STANDBY: OV)
1 REC DRIVE OUT
SW 2 TALLY ON/OFF SWITCH
H. DEFLECTION
IC202
PHASE COMPARATOR
H. OSC
H. DRIVE
Q207
Q207 INDICATOR DRIVE
VR202 H. HOLD
L3 H.SIZE
L4
HIGH VOLTAGE
T201
T200
Q206
Q206 CONVERTER TRANS DRIVE
D206
D207
D208
D209
D210
D211
D212
D213
VR203 FOCUS
VR203 1M
B13
4
5
6

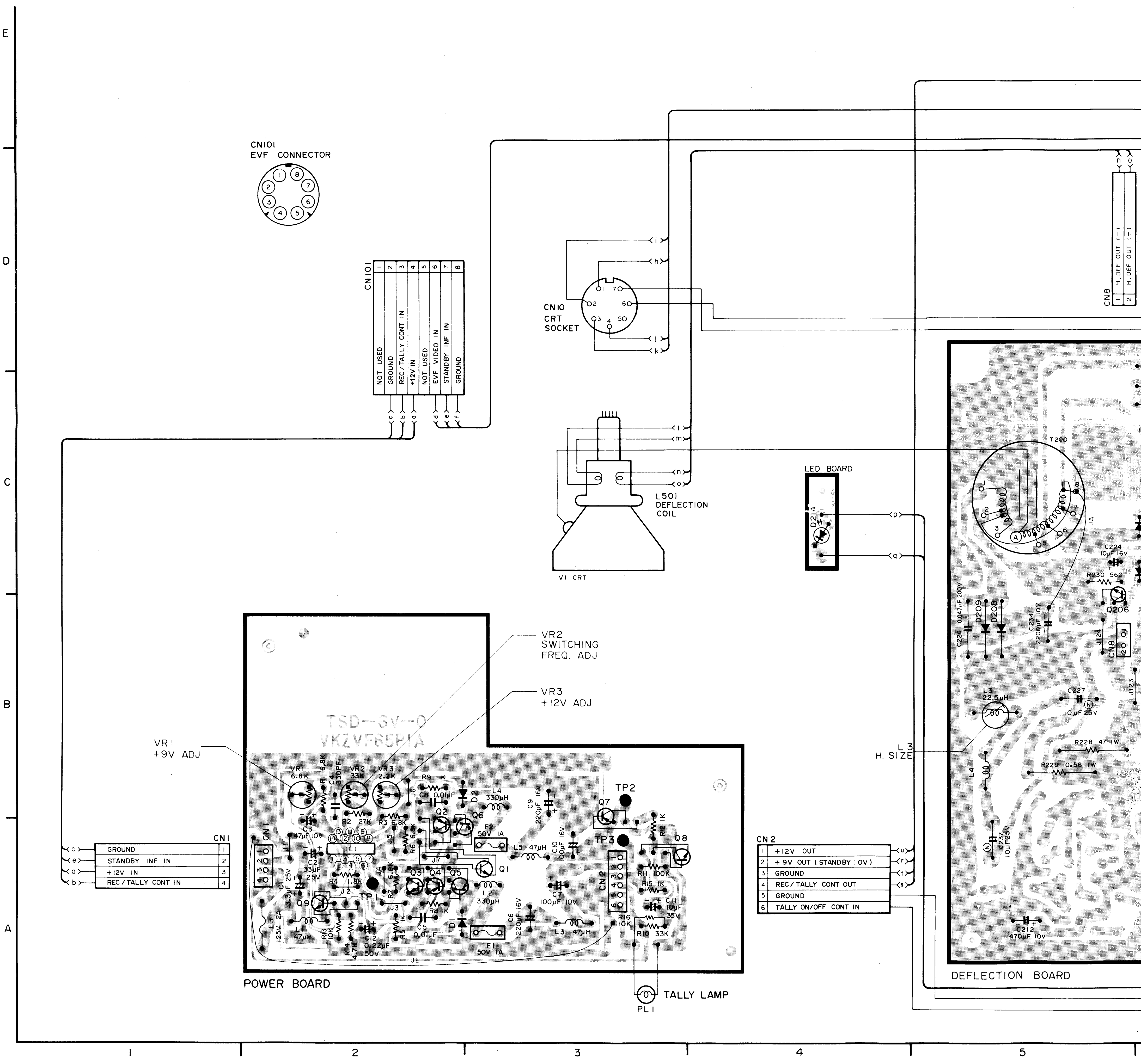
POWER BOARD

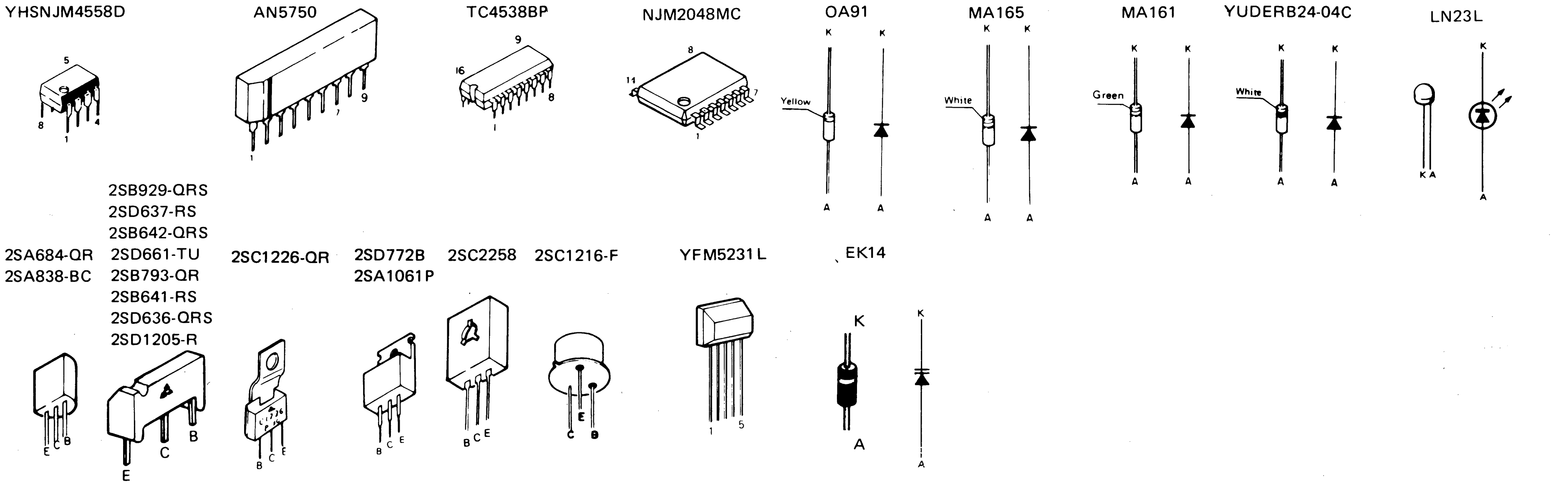
3	D1	MA161	C4	IC1	NJM2048MC	A2, A3
3	D2	MA161	C4	Q1	2SD637-RS	A2
3	D3	MA162	C4	Q2	2SB642-QRS	A2
4	D4	YUDERB24-04C	C5	Q3	2SD637-RS	A1
4	D5	OA91	C5	Q4	2SB642-QRS	A1
4				Q5	2SB929-PQ	A2
4				Q6	2SB929-PQ	A3
3				Q7	2SB793-RS	A3
3				Q8	2SD1205-QR	A3
3				Q9	2SD636-QRS	A2
				D1	EK14	A2
				D2	EK14	A3

PRODUCT SAFETY NOTE

The shaded area on this schematic diagram incorporates special features important for protection from X-Radiation, fire and electrical shock hazards. When servicing it is essential that only manufacturer's specified parts be used for the critical components in the shaded areas of the schematic.

CONDUCTOR VIEW OF 5″ VIEV

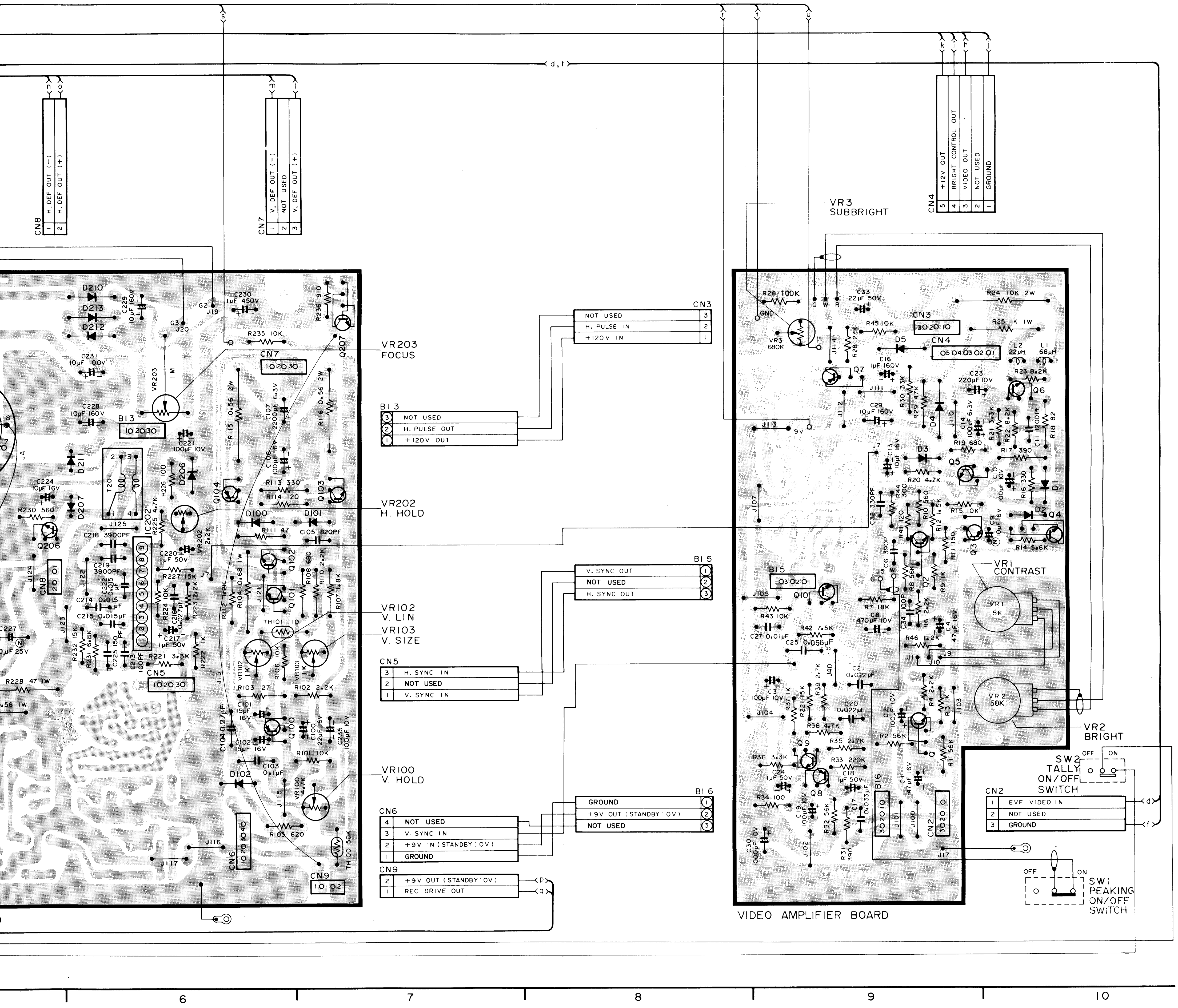

E
D
C
B
A
1
2
3
4
5
CN101 EVF CONNECTOR
CN101
1 NOT USED
2 GROUND
3 REC/TALLY CONT IN
4 +12V IN
5 NOT USED
6 EVF VIDEO IN
7 STANDBY INF IN
8 GROUND
CN10 CRT SOCKET
L501 DEFLECTION COIL
V1 CRT
LED BOARD
D214
CN8
1 H. DEF OUT (−)
2 H. DEF OUT (+)
T200
C224 10μF 16V
R230 560
Q206
C226 0.047μF 200V
D209
D208
C234 2200μF 10V
J124
CN8
C227 10μF 25V
L3 22.5μH
L3 H. SIZE
R228 47 1W
R229 0.56 1W
L4
J123
C237 10μF 25V
C212 470μF 10V
DEFLECTION BOARD
VR2 SWITCHING FREQ. ADJ
VR3 +12V ADJ
VR1 +9V ADJ
TSD-6V-0
VKZVF65P1A
VR1 6.8K
R1 6.8K
C4 330PF
VR2 33K
VR3 2.2K
R9 1K
C8 0.01μF
D2
L4 330μH
C9 220μF 16V
Q7
TP2
TP3
R12 1K
Q8
C3 47μF 10V
C2 33μF 25V
IC1
R2 27K
R3 6.8K
Q2
Q6
F2 50V 1A
L5 47μH
C10 100μF 16V
Q1
R4 1.8K
Q3
Q4
Q5
L2 330μH
C7 100μF 10V
R11 100K
R15 1K
C11 10μF 35V
C1 3.3μF 25V
Q9
TP1
R8 1K
R16 10K
R10 33K
F3 125V 2A
L1 47μH
R13
R14 4.7K
C12 0.22μF 50V
C5 0.01μF
D1
C6 220μF 16V
F1 50V 1A
L3 47μH
CN1
1 GROUND
2 STANDBY INF IN
3 +12V IN
4 REC/TALLY CONT IN
CN2
1 +12V OUT
2 +9V OUT (STANDBY : 0V)
3 GROUND
4 REC/TALLY CONT OUT
5 GROUND
6 TALLY ON/OFF CONT IN
POWER BOARD
TALLY LAMP
PL1


YHSNJM4558D
AN5750
TC4538BP
NJM2048MC
OA91
MA165
MA161
YUDERB24-04C
LN23L
Yellow
White
Green
White
K
A
2SB929-QRS
2SD637-RS
2SB642-QRS
2SA684-QR
2SA838-BC
2SD661-TU
2SB793-QR
2SB641-RS
2SD636-QRS
2SD1205-R
2SC1226-QR
2SD772B
2SA1061P
2SC2258
2SC1216-F
YFM5231L
EK14
E C B
C
B
E
B C E
B C E
C E B

DEFLECTION BO

IC202	AN5750
Q100	2SD636-QRS
Q101	2SB641-QRS
Q102	2SD636-QRS
Q103	2SC1226-QR
Q104	2SA684-QR
Q206	2SD772B
Q207	2SD1205-R

VIEWFINDER FOR WV-VF65


CN8
1 H. DEF OUT (−)
2 H. DEF OUT (+)
CN7
1 V. DEF OUT (−)
2 NOT USED
3 V. DEF OUT (+)
CN4
5 +12V OUT
4 BRIGHT CONTROL OUT
3 VIDEO OUT
2 NOT USED
1 GROUND
VR3
SUBBRIGHT
d, f
CN3
3 NOT USED
2 H. PULSE IN
1 +120V IN
VR203
FOCUS
B13
3 NOT USED
2 H. PULSE OUT
1 +120V OUT
VR202
H. HOLD
B15
1 V. SYNC OUT
2 NOT USED
3 H. SYNC OUT
VR102
V. LIN
VR103
V. SIZE
CN5
3 H. SYNC IN
2 NOT USED
1 V. SYNC IN
VR100
V. HOLD
B16
1 GROUND
2 +9V OUT (STANDBY: 0V)
3 NOT USED
CN6
4 NOT USED
3 V. SYNC IN
2 +9V IN (STANDBY: 0V)
1 GROUND
CN9
2 +9V OUT (STANDBY 0V)
1 REC DRIVE OUT
VR1
CONTRAST
VR2
BRIGHT
SW2
TALLY
ON/OFF
SWITCH
OFF
ON
CN2
1 EVF VIDEO IN
2 NOT USED
3 GROUND
SW1
PEAKING
ON/OFF
SWITCH
VIDEO AMPLIFIER BOARD
6
7
8
9
10

ECTION BOARD

AN5750	B6	D100	MA161	C6
		D101	MA161	C7
2SD636-QRS	B6	D102	MA165	A6
2SB641-QRS	B6	D206	YUDX068	C6
2SD636-QRS	B6	D207	YUDERB24-04C	C6
2SC1226-QR	C7	D208	YUDU06C	B5
2SA684-QR	C6	D209	OA91	B5
2SD772B	B6	D210	YUDERB24-04C	D6
2SD1205-R	B6	D211	YUDERB24-04C	C6
	B5	D212	YUDERB24-04C	C6
	C7	D213	YUDERB24-04C	C6
		D214	LN23L	C9

VIDEO AMPLIFIER BOARD

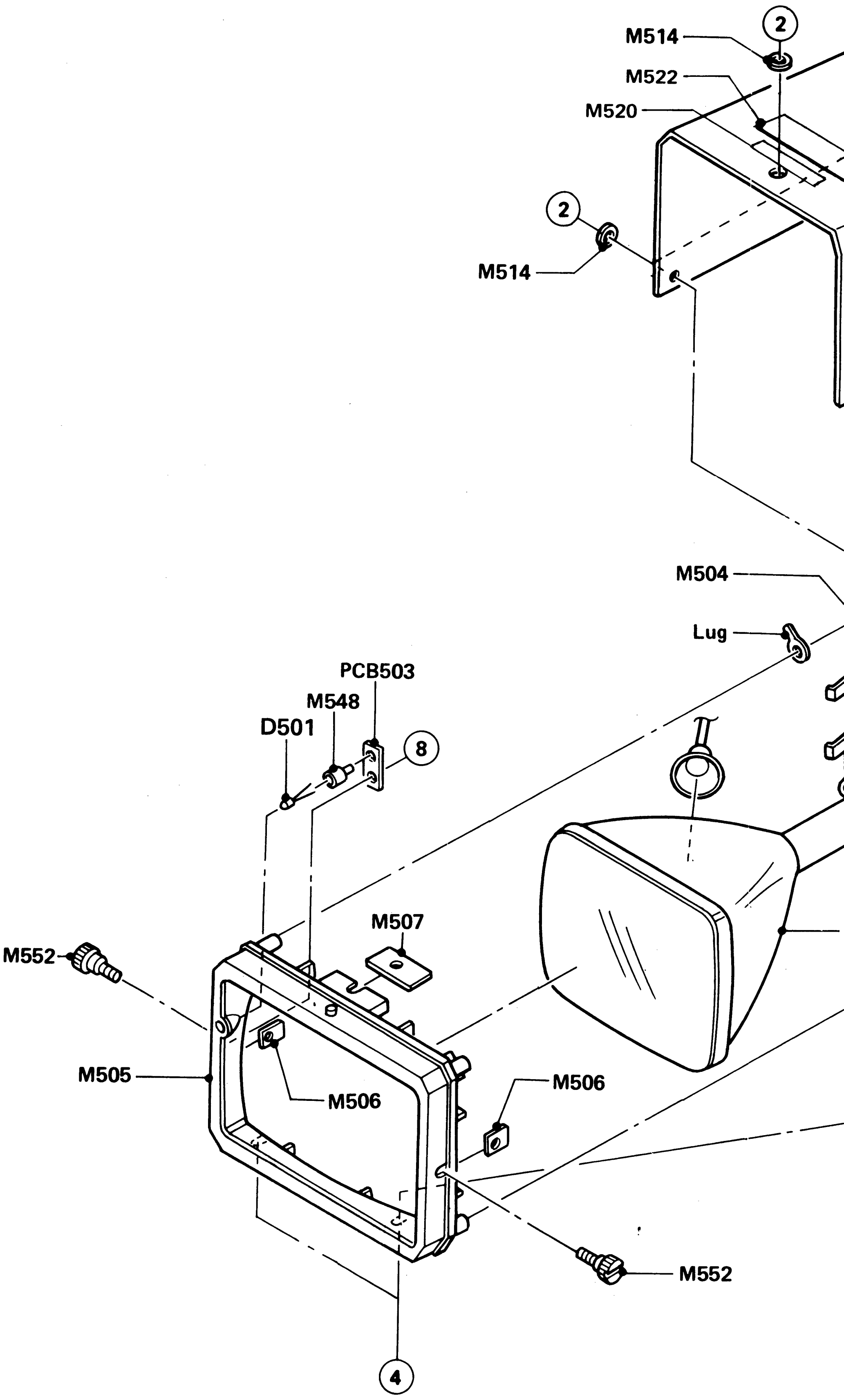
Q1	2SD636-QRS	B9
Q2	2SD636-QRS	B9
Q3	2SB641-QRS	C9
Q4	2SD636-QRS	C10
Q5	2SC1216-FS	C9
Q6	2SC2258QRS	C10
Q7	2SA1018A	C9
Q8	2SB641-QRS	A9
Q9	2SD636-QRS	A9
Q10	2SD661-TU	B9
D1	MA161	C10
D2	MA161	C10
D3	MA162	C9
D4	YUDERB24-04C	C9
D5	OA91	C9

POWER BOARD

IC1	NJM2048MC	A2
Q1	2SD637-RS	A3
Q2	2SB642-QRS	A2
Q31	2SD637-RS	A2
Q4	2SB642-QRS	A2
Q5	2SB929-PQ	A2
Q6	2SB929-PQ	A3
Q7	2SB793-RS	A3
Q8	2SD1205-QR	A3
Q9	2SD636-QRS	A2
D1	EK14	A2
D2	EK14	A2

EXPLODED VIEW OF 5

PCB501	V/F DEFECTION BOARD
PCB502	V/F VIDEO AMPLIFIER BOARD
PCB503	LED BOARD
PCB504	POWER BOARD
V1	M13JEE5WW
D501	LN23L
VR1	EVHC0AK15B53
VR2	EVHC0AK15B54
L5	YFVS33418
SW1,2	YFM2012ESG
PL1	YWS9G1012V12
E501	YF8P65CABLE
CN10	YWS-7-502B-40
CN13	YWM20201A
M501	YFV5EC0063A3
M502	YWV3805CM01
M503	YFV5YA0013A4
M504	YFV2SA0101A4
M505	YWV3805DR01
M506	YWV3805LM02
M507	YWV930-LM01
M508	YWV385PKR01V
M509	YWV385PLR01U
M510	YWV3805AM02
M511	YFV5EC0067B2
M512	YWV3805CM02
M513	YFV5EC0064A2
M514	YFV1KA0001A4
M515	YFV5WA0060A3
M516	YFV2SA0046A4
M517	YWV3801HR01
M518	YWSR5N4
M519	YFV7QA0933A4 YFV7QA0934A4
M520	YFV7MA0099A4
M522	YWS-XEGRB03A
M523	YWS-LM010A YWS-LM011A
M524	YFBE-40
M525	YFV2CB0019A4
M526	YFV2NA0009A4
M527	YFV2TA0054A4
M528	YFV2NA0009A4
M529	YFV2WA0017A3
M530	YFV2WA008A3
M531	YFV5RA0014A4
M532	YFV5RA0015A3
M533	YWV1800FR03
M534	YFV1BA0003A4
M535	YFV1BA0004A4
M536	YFV2HA0054A3
M537	YFV2HA0055A4
M538	YFV2PA0070A4
M539	YWV3805LB01
M545	YFV7MA0204A4
M546	YWS-WULRB01A
M548	YWE2400FR01
M549	YWV3805FM01



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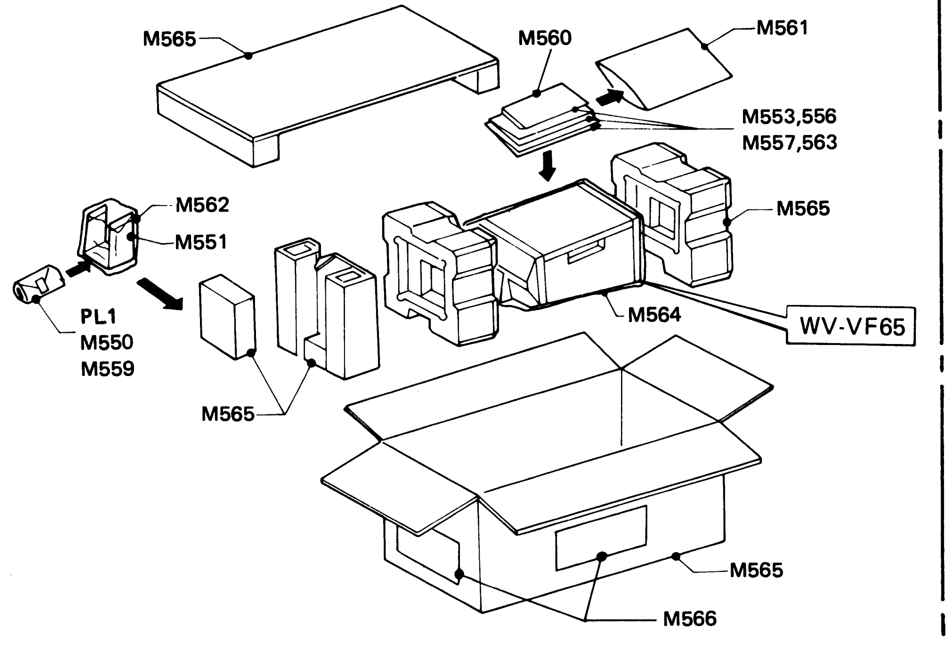
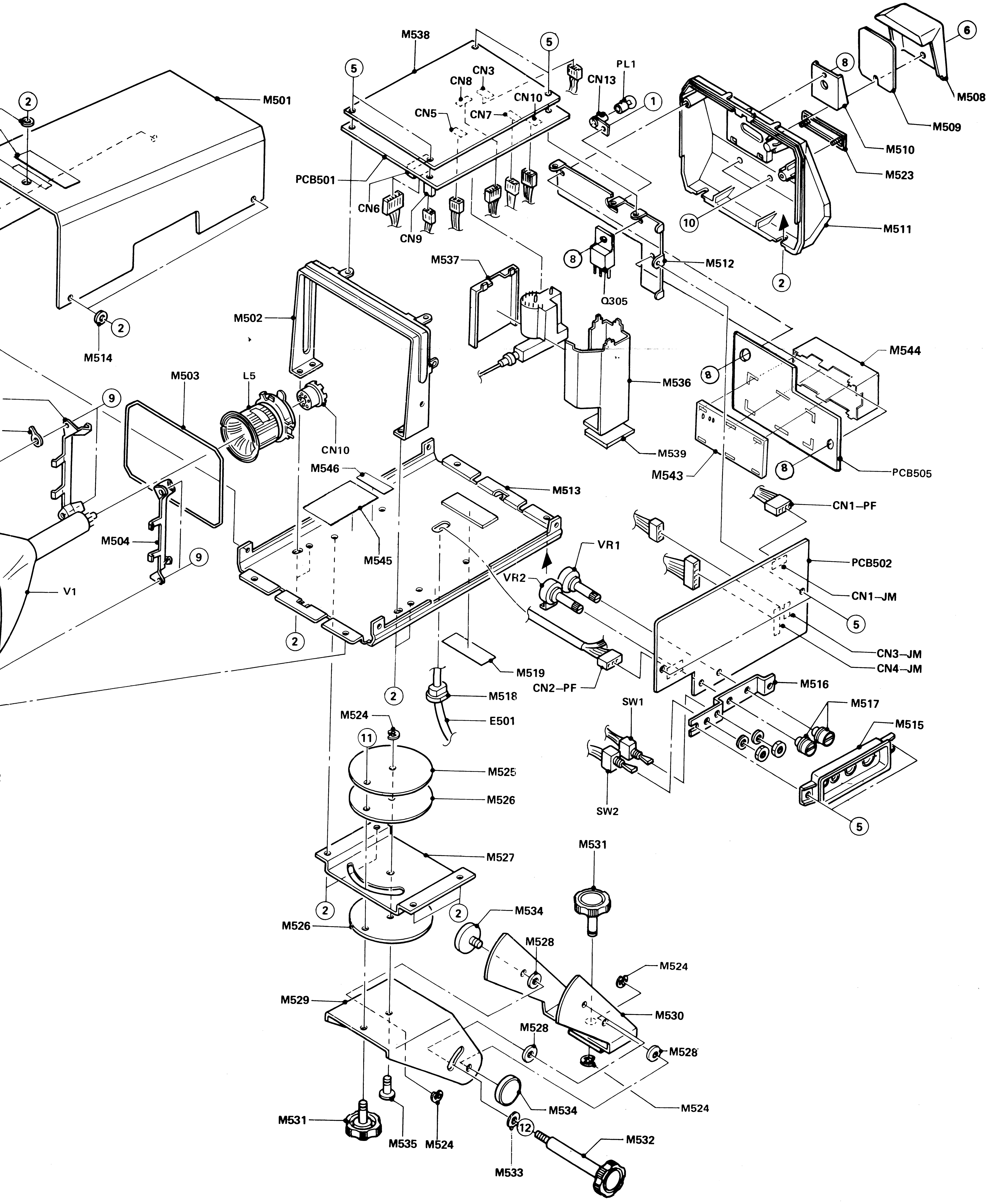


PL1	YWSQG1012V12
M550	YFV5MA0011A4
M551	YFV6BA0015A3
M552	YWV3805FM01
M553	YFV8QA0902AN YFV8QA0903AN
M556	YWV385PLR02U
M557	YWV385PLR03U
M558	YFV5MA0020A4
M559	YWT10X10C03
M560	YWT10X16C03
M561	YWT20X25C03
M562	YWT20X35C03
M563	XZB26X40C05
M564	XZB35X50C05
M565	YFV9CA339AN
M566	YFV8FA0004A3 YNL2E

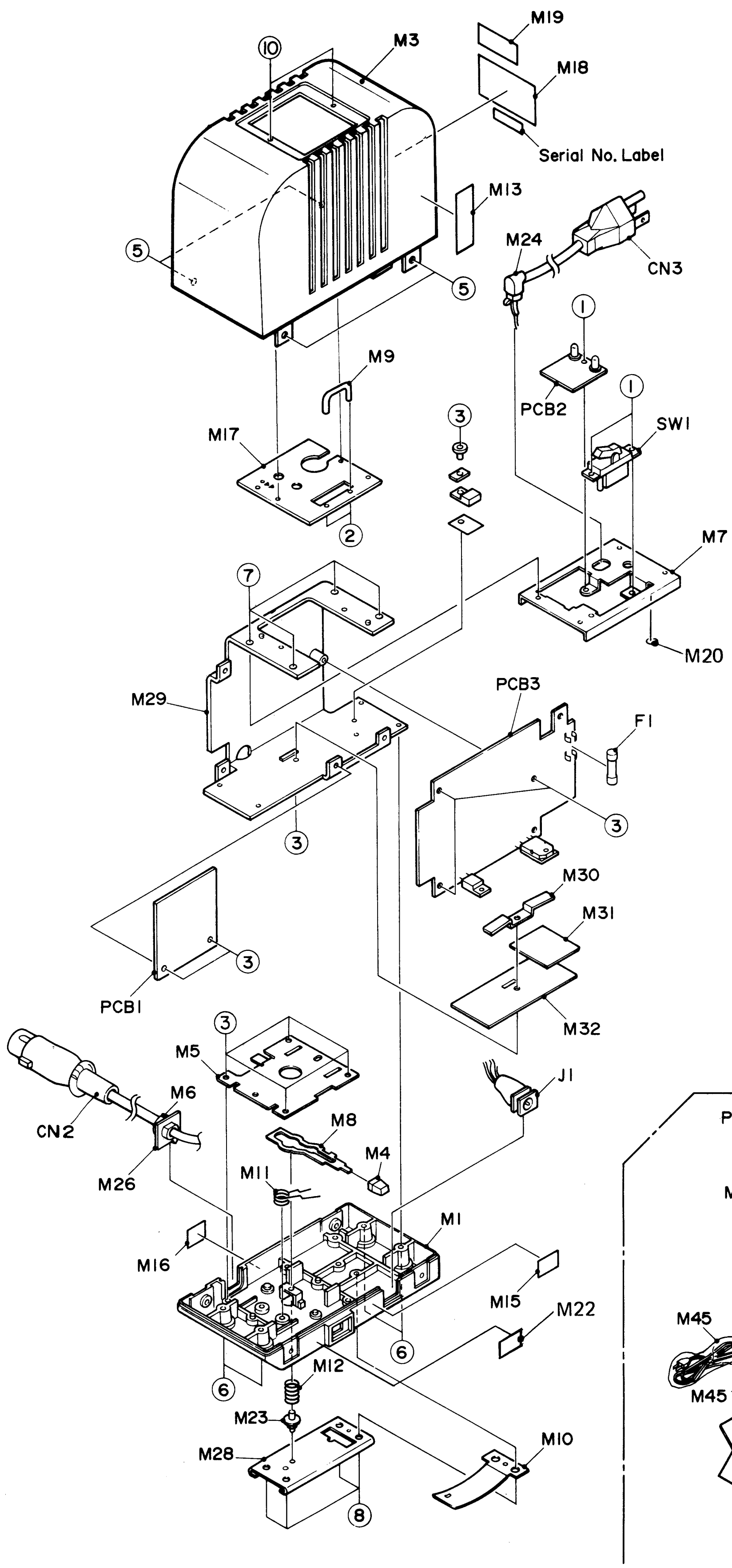
○ Numbers show Screws

No.	Screw	Description
①	XSB3+6FX	Binding Head Screw
②	XSB3+6FXN	Binding Head Screw
③	XSB3+4FXK	Binding Head Black Screw
④	XSB3+6FXK	Binding Head Black Screw
⑤	XSB3+6FXV	Binding Head Violet Screw
⑥	XSB26+8FXK	Binding Head Black Screw
⑦	XSB26+4FXK	Binding Head Black Screw
⑧	XTB3+8BFX	Binding Head Tapping Screw
⑨	XTB4+20BFX	Binding Head Tapping Screw
⑩	XNG3GFX	Hexagon Head Nut
⑪	XUC4FN	Retaining Ring Type E
⑫	XWE6FN	Small Round Plain Washer

OF 5″ VIEWFINDER (WV-VF65)


M538
⑤
⑤
CN3
CN8
CN13
PL1
①
⑥
⑧
M508
M501
②
CN10
CN5
CN7
M509
M510
M523
PCB501
CN6
CN9
⑩
M511
M537
⑧
M512
②
Q305
M502
②
M514
M544
M536
⑧
M503
L5
⑨
CN10
M546
M539
M543
PCB505
⑧
M513
CN1–PF
M504
M545
⑨
VR1
VR2
PCB502
V1
CN1–JM
⑤
②
CN3–JM
CN4–JM
M519
CN2–PF
M516
M518
②
SW1
M517
M524
E501
M515
⑪
M525
M526
SW2
⑤
M531
M527
②
②
M534
M526
M528
M524
M529
M530
M528
M528
M524
M534
M531
M535
M524
⑫
M532
M533

EXPLODED VIEW OF AC ADPTOR/CHARGER (WV-PS31)

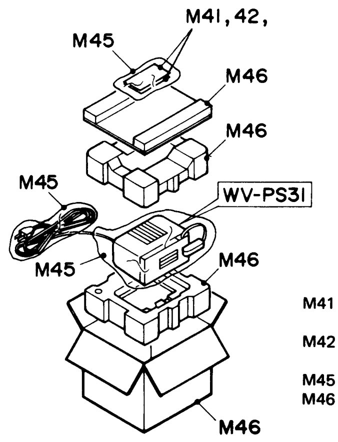

M19
⑩
M3
M18
Serial No. Label
M13
M24
⑤
⑤
CN3
①
M9
PCB2
①
M17
③
SW1
②
M7
⑦
M20
M29
PCB3
F1
③
③
M30
M31
③
PCB1
M32
③
M5
J1
M6
CN2
M8
M4
M26
M11
M1
M16
M15
M22
⑥
M12
⑥
M23
M10
M28
⑧

○Numbers Show Screws

No.	Screws	Description
①	XSB26+4FX	Binding Head Screws
②	XSB26+6FX	Binding Head Screws
③	XSB3+6FX	Binding Head Screws
④	XSB4+6FX	Binding Head Screws
⑤	XSB3+6FXK	Binding Head Black Screws
⑥	XSB3+16FXK	Binding Head Black Screws
⑦	XSS26+6FX	Flush Machine Screws
⑧	XSS3+6FXK	Flush Machine Black Screws
⑨	XWC4BFX	Extarnal Toothed Lock Washer
⑩	XSB3+8FXK	Binding Head Black Screws

PCB1	Control Board
PCB2	LED Board
PCB3	Power Board
SW1	EST15702V
F1	YFX1C20NU100
CN1	YWQMA1221B
CN2	YFCABLEPS31
CN3	YWKP30SVT310
M1	YFV5EA0332A1
M3	YFV5KA0066A1
M4	YFV6JA0012A4
M5	YFV2CA0093A4
M6	YFV6FA0041A4
M7	YFV6FA0042A4 YFV6FB0042A4
M8	YFV2EA0034A4
M9	YWV8310HM02
M10	YFV4JA0082A4
M11	YFV4JA0083A4
M12	YFV4JA0084A4
M13	YFV7MA0099A4
M15	YFV7MA0194A4
M16	YFV7MA0195A4
M17	YFV7QA0862A4
M18	YFV7QA0870A4 YFV7QA0869A4 YFV7QA0868A4 YFV7QA0867A4 YFV7QA0866A4
M19	YFV7SA0267A4 YVV7SA0270A4
M20	YW-BCG-UR01B
M22	YFV7SA0265A4
M23	YFV1HA0016A4
M24	YWSR15-1 YWSR6N-3
M26	YWSR5N4
M28	YFV5MA0013A4
M29	YF2JF00A348B
M30	YF4ER03068
M31	YF4ER03072
M32	YF4ER03070

PACKAGING


M41, 42,
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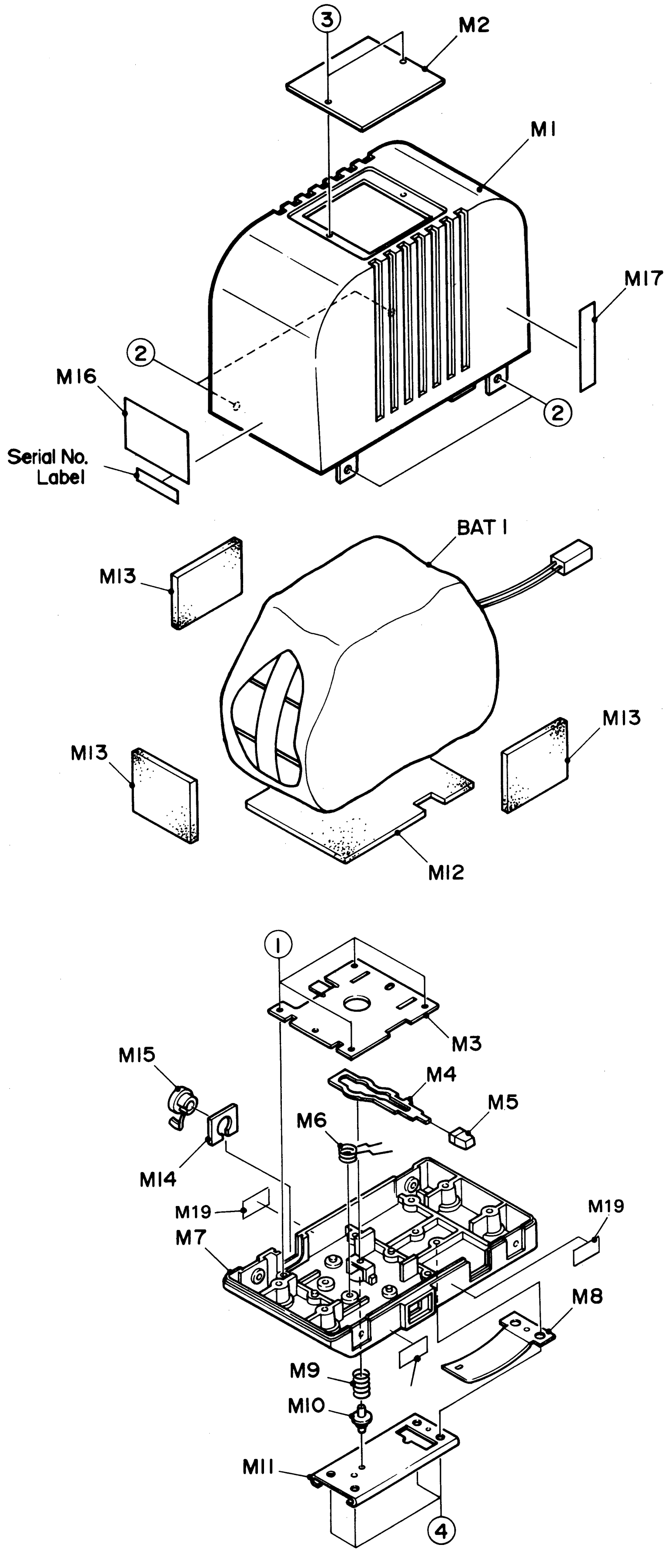
M46
M46
M45
WV-PS31
M45
M46
M46

M41	YFV8QA0864AN YFV8QA0865AN
M42	19998700331 19998700419
M45	XZB26X40C05
M46	YFV9CA0686AN YFV9CA0687AN

EXPLODED VIEW OF BATTERY PACK (WV-PS33)


③
M2
M1
M17
②
M16
②
Serial No. Label
BAT I
M13
M13
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①
M3
M15
M4
M5
M6
M14
M19
M7
M19
M8
M9
M10
M11
④

○Numbers Show Screws

No.	Screws	Description
①	XSB3+6FX	Binding Head Screws
②	XSB3+6FXK	Binding Head Black Screws
③	XSB26+4FXK	Binding Head Black Screws
④	XSS3+6FXK	Flush Head Machine Black Screws

BAT1	P-35-10A05P
CN1	YWQMA1221B
M1	YFV5KB0066A1
M2	YFV5EA0334A4
M3	YFV2CA0093A4
M4	YFV2EA0034A4
M5	YFV6JA0012A4
M6	YFV4JA0083A4
M7	YFV5EB0332A1
M8	YFV4JA0082A4
M9	YFV4JA0084A4
M10	YFV1HA0016A4
M11	YFV5MA0013A4
M12	YFV2FA0106A4
M13	YFV2FA0107A4
M14	YFV2SA0209A4
M15	YWSR2P4
M16	YFV7QA0865A4
M17	YFV7MA0099A4
M18	YFV7SA0265A4
M19	YFV7MA0194A4

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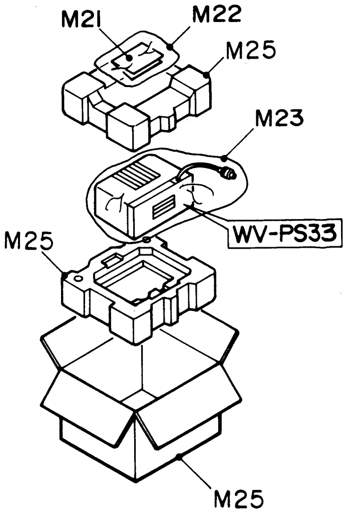
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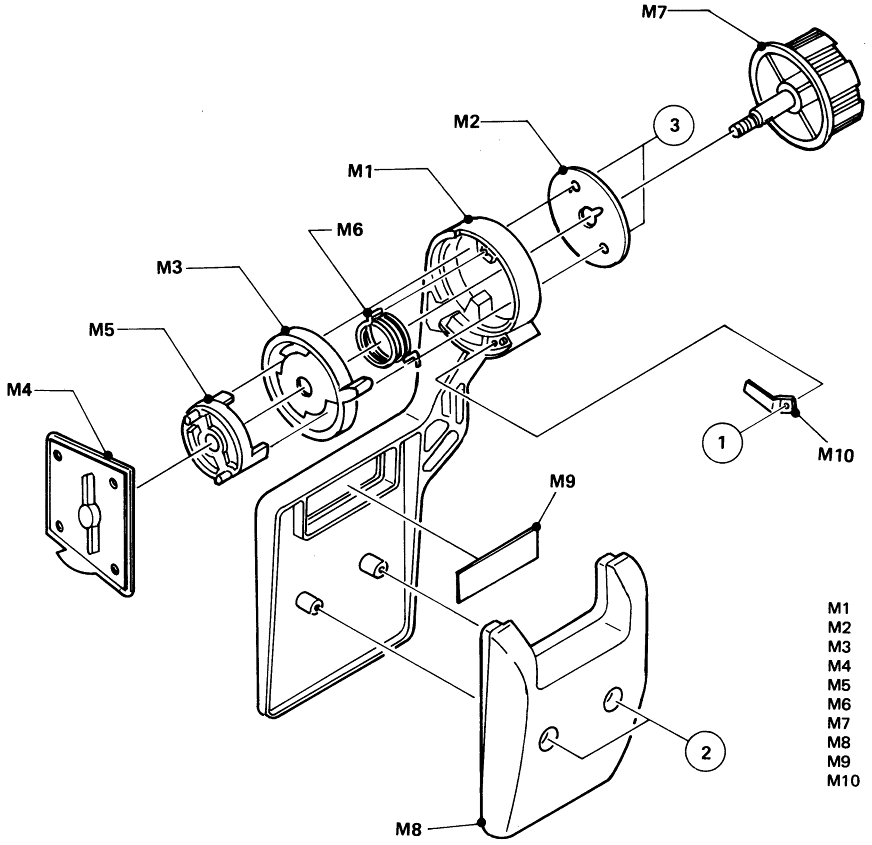
M22
M25
M23
WV-PS33
M25
M25

M21	YFV8QA0861AN
M22	YFV8SA0009CN
M23	XZB26X40C05
M25	YFV9CA0683AN

EXPLODED VIEW OF CHEST PAD (WV-Q30)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M1
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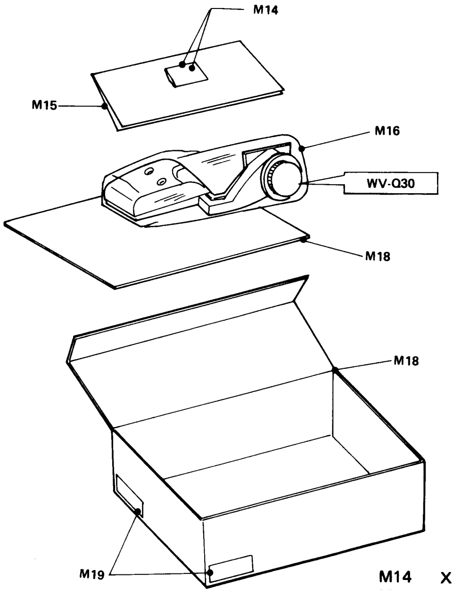
M10
M9
2
M8

M1	YFV4AA0013A1
M2	YFV2CA0097A4
M3	YFV3EA0006A3
M4	YFV4EA0007A3
M5	YFV2EA0036A1
M6	YFV4JA0110A4
M7	YFV5RA0066A3
M8	YFV5VA0040A3
M9	YFV7QA0957A4
M10	YFV4JA0109A4

○ Numbers show screws

No.	Screws	Description
1	XSB2+4FXK	Binding Head Black Screws
2	XSB26+6FZK	Binding Head Black Screws
3	XSS3+8FZK	Flush Head Machine Black Screws

PACKAGING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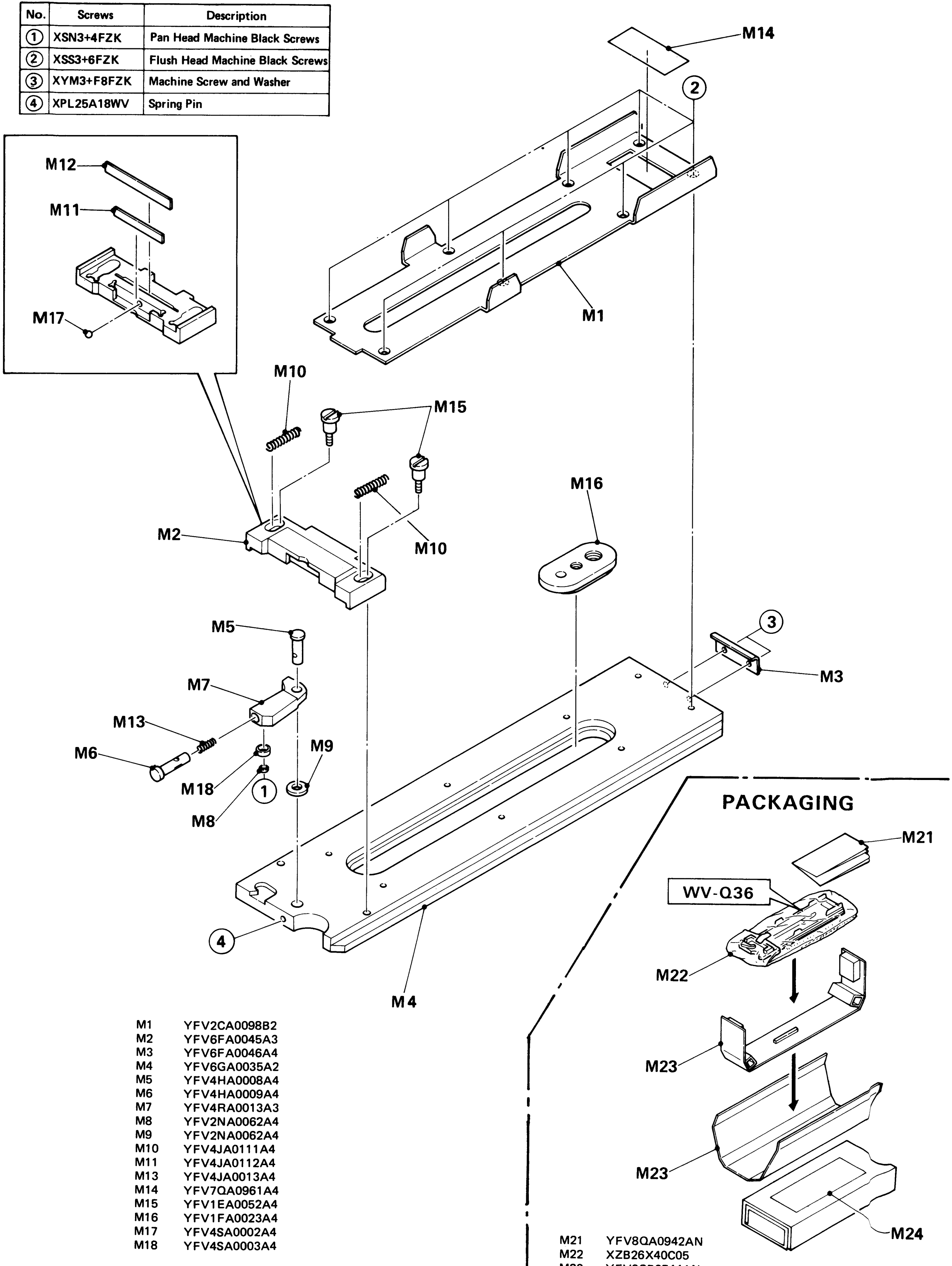
M15
M16
WV-Q30
M18
M18
M19

M14	XSS26X8FZK
M15	YFV8QA0936AN
M16	YWT20X25003
M17	YWT050803
M18	YFV9CC0723AN
M19	YFV8FA0002A4

EXPLODED VIEW OF TRIPOD MOUNTING ADAPTOR (WV-Q36)

○ Numbers show screw

No.	Screws	Description
①	XSN3+4FZK	Pan Head Machine Black Screws
②	XSS3+6FZK	Flush Head Machine Black Screws
③	XYM3+F8FZK	Machine Screw and Washer
④	XPL25A18WV	Spring Pin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M18
①
M8
M9
③
M3
④
M4
PACKAGING
M21
WV-Q36
M22
M23
M23
M24

M1	YFV2CA0098B2
M2	YFV6FA0045A3
M3	YFV6FA0046A4
M4	YFV6GA0035A2
M5	YFV4HA0008A4
M6	YFV4HA0009A4
M7	YFV4RA0013A3
M8	YFV2NA0062A4
M9	YFV2NA0062A4
M10	YFV4JA0111A4
M11	YFV4JA0112A4
M13	YFV4JA0013A4
M14	YFV7QA0961A4
M15	YFV1EA0052A4
M16	YFV1FA0023A4
M17	YFV4SA0002A4
M18	YFV4SA0003A4

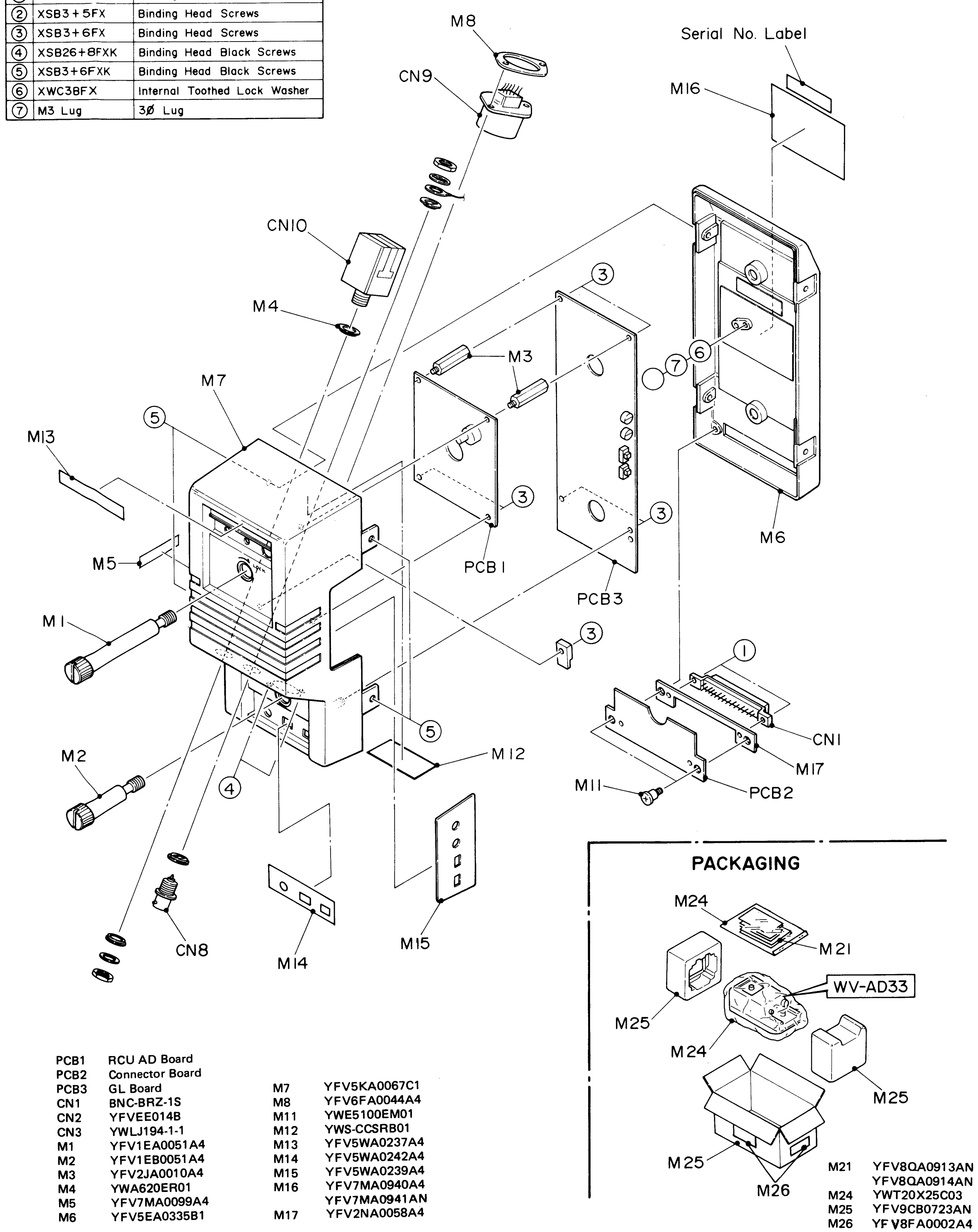
M21	YFV8QA0942AN
M22	XZB26X40C05
M23	YFV9CB0744AN
M24	YFV8FA0002A4

EXPLODED VIEW

RCU/GEN-LOCK ADAPTOR (WV-AD33)

○ Numbers Show Screws

No.	Screws	Description
①	XSB26 + 8FN	Binding Head Screws
②	XSB3 + 5FX	Binding Head Screws
③	XSB3+6FX	Binding Head Screws
④	XSB26+8FXK	Binding Head Black Screws
⑤	XSB3+6FXK	Binding Head Black Screws
⑥	XWC3BFX	Internal Toothed Lock Washer
⑦	M3 Lug	30 Lug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CN9
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CN10
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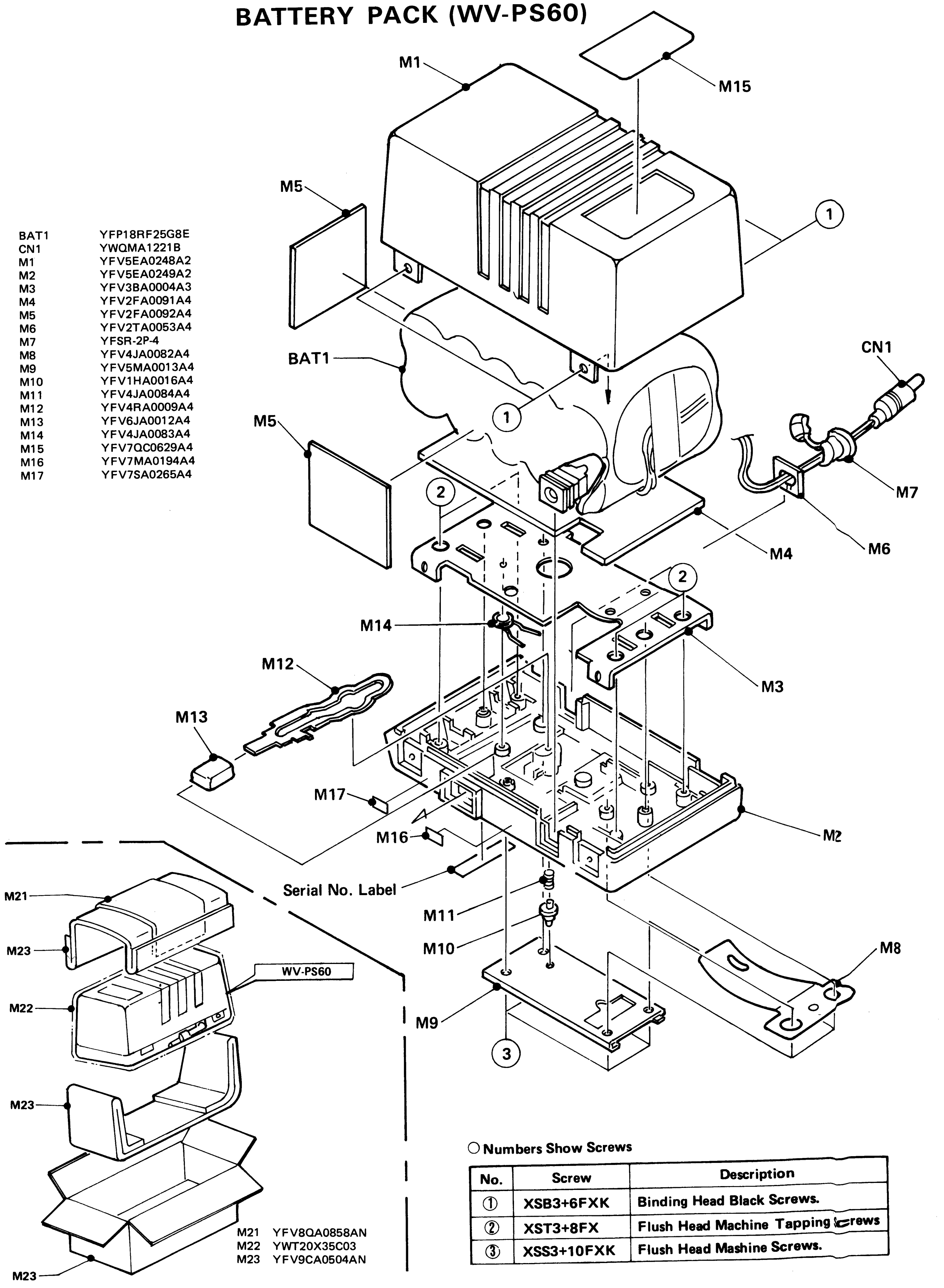
③
M3
M7
⑤
⑦
⑥
M13
M5
M1
PCB1
PCB3
M6
③
①
CN1
M17
M11
PCB2
M12
⑤
④
M2
CN8
M14
M15
PACKAGING
M24
M21
WV-AD33
M25
M24
M25
M25
M26

PCB1	RCU AD Board		
PCB2	Connector Board		
PCB3	GL Board	M7	YFV5KA0067C1
CN1	BNC-BRZ-1S	M8	YFV6FA0044A4
CN2	YFVEE014B	M11	YWE5100EM01
CN3	YWLJ194-1-1	M12	YWS-CCSRB01
M1	YFV1EA0051A4	M13	YFV5WA0237A4
M2	YFV1EB0051A4	M14	YFV5WA0242A4
M3	YFV2JA0010A4	M15	YFV5WA0239A4
M4	YWA620ER01	M16	YFV7MA0940A4
M5	YFV7MA0099A4		YFV7MA0941AN
M6	YFV5EA0335B1	M17	YFV2NA0058A4

M21	YFV8QA0913AN YFV8QA0914AN
M24	YWT20X25C03
M25	YFV9CB0723AN
M26	YFV8FA0002A4 YNL1E

BATTERY PACK (WV-PS60)

BAT1	YFP18RF25G8E
CN1	YWQMA1221B
M1	YFV5EA0248A2
M2	YFV5EA0249A2
M3	YFV3BA0004A3
M4	YFV2FA0091A4
M5	YFV2FA0092A4
M6	YFV2TA0053A4
M7	YFSR-2P-4
M8	YFV4JA0082A4
M9	YFV5MA0013A4
M10	YFV1HA0016A4
M11	YFV4JA0084A4
M12	YFV4RA0009A4
M13	YFV6JA0012A4
M14	YFV4JA0083A4
M15	YFV7QC0629A4
M16	YFV7MA0194A4
M17	YFV7SA0265A4


M1
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M5
①
BAT1
CN1
①
M5
②
M7
M4
M6
②
M14
M3
M12
M13
M17
M16
M2
Serial No. Label
M11
M10
M8
M9
③
M21
M23
WV-PS60
M22
M23
M23

M21	YFV8QA0858AN
M22	YWT20X35C03
M23	YFV9CA0504AN

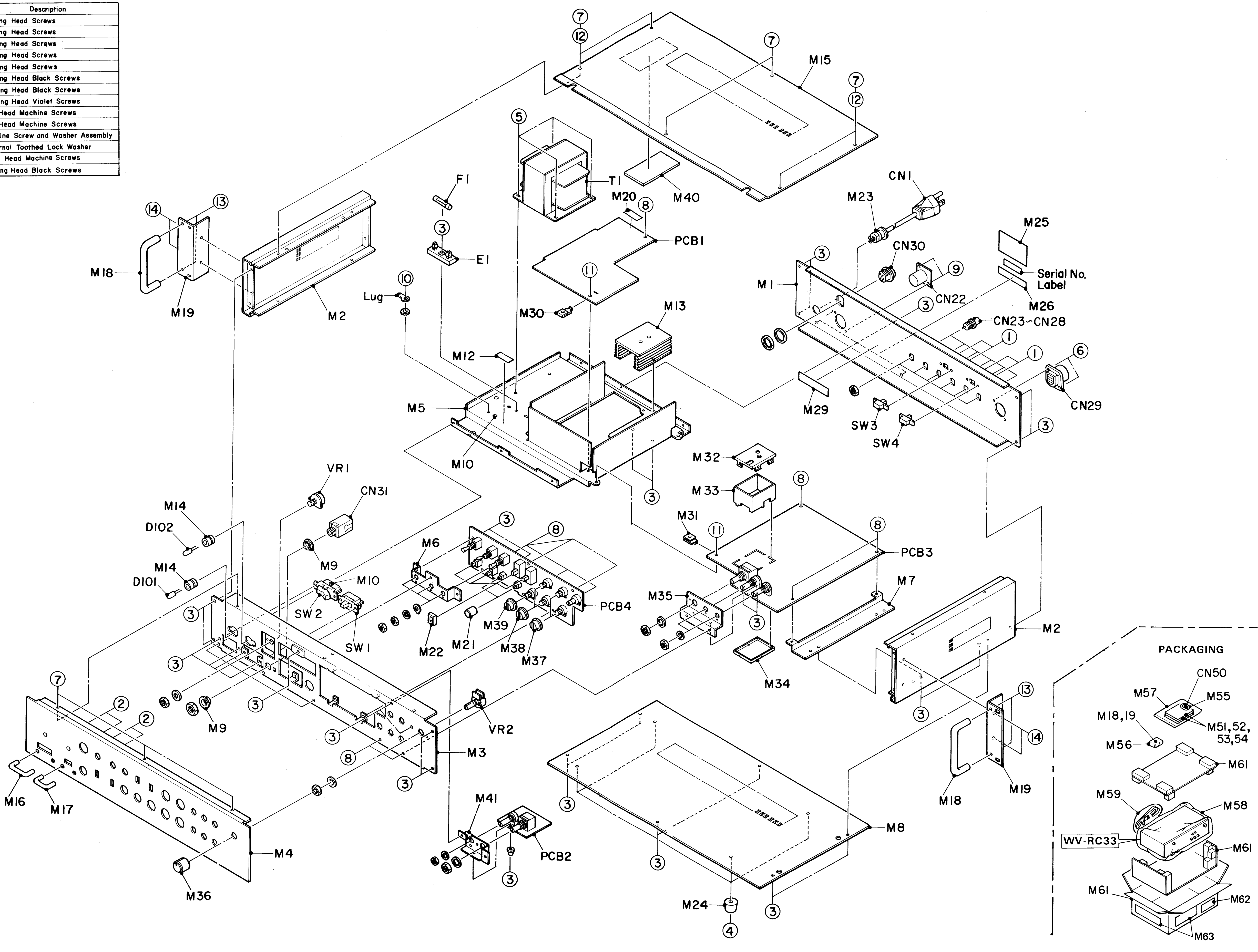
○ Numbers Show Screws

No.	Screw	Description
①	XSB3+6FXK	Binding Head Black Screws.
②	XST3+8FX	Flush Head Machine Tapping Screws
③	XSS3+10FXK	Flush Head Mashine Screws.

EXPLODED VIEW OF REMOTE CONTROL UNIT (WV-RC33)

No.	Screw	Description
①	XSB2+4FX	Binding Head Screws
②	XSB26+6FX	Binding Head Screws
③	XSB3+6FX	Binding Head Screws
④	XSB3+10FX	Binding Head Screws
⑤	XSB4+6FX	Binding Head Screws
⑥	XSB26+8FXK	Binding Head Black Screws
⑦	XSB3+6FXK	Binding Head Black Screws
⑧	XSB3+6FXV	Binding Head Violet Screws
⑨	XSN26+8FXN	Pan Head Machine Screws
⑩	XSN3+8FXN	Pan Head Machine Screws
⑪	XYM3+C6FXV	Machine Screw and Washer Assembly
⑫	XWC3BFN	External Toothed Lock Washer
⑬	XSS4+8FN	Flush Head Machine Screws
⑭	XSB4+8FXK	Binding Head Black Screws

PCB1	Power Board
PCB2	SC Board
PCB3	Video Board
PCB4	Panel Board
Q1	2SB941-PQR
Q2	2SB946-PQ
D101	LN21RPH
D102	LN31-GCP
R101	ERD25FJ750
VR1	EVHC0AP15B13
VR2	EVHC0HP20B14
T1	YFPHB76V033
SW1	ESD391T
SW2	EST1542R
SW3,4	YSTS-J0282-4
F1	XBA2C31ET0
F2	YWST6-1R5A
CN1	YWHBS-3-08 YWCE0099-08F YWVM0099-08 YWKPGTSA-3
CN2	YFXLR-432F
CN3–8	YWBNC-R
CN9	RP519RB14SR
CN10	YFCNR-1204J
CN11	YWLJ194-1-1
E1	YWXN1153-07
M1	YFV5WA0241A2
M2	YFV5WA0336A2
M3	YFV2KA0127A2
M4	YFV5WA0240A2 YFV5WB0240A2
M5	YFV2KA0129A2
M6	YFV2SA0211A4
M7	YFV2SA0212A4
M8	YFV5EA0338A2
M9	YWA620AER01
M10	YW-BCG-UR01B
M12	YFV7MA0091A4
M13	YFV7DA0002B4
M14	YWJ800PWB01
M15	YFV5EA0337A2
M16	YFV5DA0005A4
M17	YWV8310HM02
M18	YWB350-HM01
M19	YWU-L88HA
M20	YFV7MA0091A4
M21	YFV6JA0036A4
M22	YFV3AA0014A4
M23	YWSR6W-1
M24	YWV5350WB01
M25	YFV7QA0945A4 YFV7QA0946A4 YFV7QA0947AN YFV7QA0948AN YFV7QA0949AN
M26	YFV7MB0104A4
M31	YFV2SA0215A4
M32	YFV2HA0219A4
M33	YFV2HA0220A4
M34	YFV2HA0221A4
M35	YFV2SA0214A4
M35	YFV5RA0012A3
M36	YFV5RA0012A3
M37	YFV5RC0004A4
M38	YFV5RB0004A4
M39	YWV3801HR01
M40	YFV2FA0046A4



⑦
⑫
⑦
M15
⑦
⑫
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T1
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⑧
M40
PCB1
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③
E1
CN1
M23
CN30
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③
⑨
M1
CN22
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⑥
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SW3
SW4
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⑬
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M61
M62
M63

CN50	YFCNR-1204P
M18	YWB350-HM01
M19	YWU-L88HA
M51	YFV8QA0917AN YFV8QA0918AN
M52	19998700331 19998700419
M53	YWV22XPRB99K
M54	YFV8SA0009CN
M55	YWT050803
M56	YWT20X35C03
M57	XZB26X40C05
M58	XZB45X63C05
M59	YWT15X20C03
M61	YFV9CB0726AN
M62	YWSSNPRB06
M63	YFV8FA0004A3 YNL2E

Important Notice

REPLACEMENT PARTS LIST

1. Components identified by ⚠ mark have special characteritics important for safety.
   When replacing any of these components, use only manufacturer's specified parts.
2. Components identified by o mark are new parts used from this model.
3. Complete printed circuit board assembly is not available as replacement part.

AC ADAPTOR/CHARGER WV-PS31

MISCELLANEOUS

SYMBOL NO.	PART NO.	DESCRIPTION
SW1 ⚠	EST15702V	Seesaw Switch
F1 ⚠	YFX1C20NU100	Current Fuse 2A
CN1	YWQMA1221B	DC Jack for Battery
CN2	o YFCABLEPS31	DC Out Cable
CN3 ⚠	YWHBS-3-08	AC Power Cord for WV-PS31/B
⚠	YWCE0099-08F	AC Power Cord for WV-PS31/C
⚠	YWVM0099-08	AC Power Cord for WV-PS31/G
⚠	YWCE0099-08F	AC Power Cord for WV-PS31N
⚠	YWKPGTSA-3	AC Power Cord for WV-PS31NA
M1	o YFV5EA0332A1	Bottom Cover
M3	o YFV5KA0066A1	Upper Case
M4	YFV6JA0012A4	Lock Button
M5	o YFV2CA0093A4	Hold Plate
M6	o YFV6FA0041A4	Bracket for Cord Bushing
M7	o YFV6FA0042A4	Switch Mounting
M8	o YFV2EA0034A4	Lock Level Guide
M9	YWV8310HM02	Mounting Handle
M10	YFV4JA0082A4	Spring for Shoe
M11	YFV4JA0083A4	Spring for Lock Level
M12	YFV4JA0084A4	Spring for Stopper Pin
M13 ⚠	YFV7MA0099A4	UL Caution Label
M15	YFV7MA0194A4	Safety Label
M16	YFV7MA0195A4	Output Label
M17	YFV7QA0862A4	Switch Label
M18 ⚠	o YFV7QA0870A4	Main Label for WV-PS31/B
⚠	o YFV7QA0869A4	Main Label for WV-PS31/C
⚠	o YFV7QA0868A4	Main Label for WV-PS31/G
⚠	o YFV7QA0866A4	Main Label for WV-PS31N
⚠	o YFV7QA0867A4	Main Label for WV-PS31NA
M19	YFV7SA0267A4	Charge Caution Label for WV-PS31/ B,C WV-PS31N
	YFV7SA0270A4	Charge Caution Label for WV-PS31/G
M20	YW-BCG-UR01B	Earth Label for WV-PS31/BCG, WV-PS31NA
M22	YFV7SA0265A4	Caution Label for WV-PS31/BCG
M23	YFV1HA0016A4	Stopper Pin
M24	YWSR15-1	Cord Clamp
M26	YWSR5N4	Cord Clamp
M28	YFV5MA0013A4	Shoe for Battery Pack

CONTROL BOARD

SYMBOL NO.	PART NO.	DESCRIPTION
PCB1	o YFVKYPS31P1A	Printed Circuit Board Assy
IC1	NJM2904	IC
IC2	YWNJM78L05A	IC
Q1,2	2SA564-QRS	Transistor
Q3 ⚠	2SC1318-QR	Transistor
Q5 ⚠	2SC828-QRS	Transistor
Q6	2SC828A-RS	Transistor
Q7	2SC828-QRS	Transistor
D1	MA165	Diode
D2 ⚠	YF5BL2C41	Diode
R1	ERD10TJ104	Carbon 100K ohms 1/8W
R2	ERD10TJ472	Carbon 4.7K ohms 1/8W
R3	ERD10TJ333	Carbon 33K ohms 1/8W
R4	ERD10TJ821	Carbon 820 ohms 1/8W
R5	ERD10TJ121	Carbon 120 ohms 1/8W
R6	ERD10TJ105	Carbon 1M ohms 1/8W
R7,8	ERD10TJ103	Carbon 10K ohms 1/8W
R9	ERD10TJ271	Carbon 270 ohms 1/8W
R10	ERD10TJ183	Carbon 18K ohms 1/8W
R11	ERD10TJ102	Carbon 1K ohms 1/8W
R12	ERD10TJ273	Carbon 27K ohms 1/8W
R13	ERD10TJ105	Carbon 1M ohms 1/8W
R14	ERD10TJ102	Carbon 1K ohms 1/8W
R15	ERD10TJ182	Carbon 1.8K ohms 1/8W
R16	ERD10TJ223	Carbon 22K ohms 1/8W
R17	ERD10TJ222	Carbon 2.2K ohms 1/8W
R18	ERD10TJ682	Carbon 6.8K ohms 1/8W
R19	ERD10TJ103	Carbon 10K ohms 1/8W
R23	ERD10TJ682	Carbon 6.8K ohms 1/8W
R24	ERD10TJ103	Carbon 10K ohms 1/8W
R25	ERD10TJ100	Carbon 10 ohms 1/8W
R26	ERD10TJ102	Carbon 1K ohms 1/8W
R27	ERD10TJ154	Carbon 150K ohms 1/8W
R28	ERD10TJ473	Carbon 47K ohms 1/8W
R29	ERW12PJR10	Wier Wound Resistor 0.1 ohms 1/2W
R30	ERD10TJ222	Carbon 2.2K ohms 1/8W
VR1	YFH0621A33K	Variable Resistor 33K ohms
VR2	EVM8AGA00B13	Variable Resistor 1K ohms
VR3	YFH0621A33K	Variable Resistor 33K ohms
C1	ECEA1EU221	Electrolytic 220μF 25V
C2,3	ECQM1H104JZ	Plastic Capacitor 0.1μF 50V
C4	ECEA0JKS101	Electrolytic 100μF 6.3V
C5	ECEA1HKS3R3	Electrolytic 3.3μF 50V
C6	ECEA0JKS220	Electrolytic 22μF 6.3V
CN1-JM	S5PS2T2EF	5 pin Jack Male

LED BOARD

SYMBOL NO.	PART NO.	DESCRIPTION
PCB2	o YFVRZPS31P1B	Printed Circuit Board Assy
D3	MA27TA	Diode
D4	LN11WP23	LED
D5	LN21RPHL	LED
D6	MA4100L	Diode

POWER BOARD for WV-PS31/BCG,WV-PS31NA

SYM-BOL NO.	PART NO.	DESCRIPTION	
PCB3	oYFA348C	Printed Circuit Board Assy	
IC1 ⚠	oAC037	IC	
IC51	oUPC358C	IC	
Q1 ⚠	2SK538 or	Transistor	
	2SK415	Transistor	
D1	o1J4B41	Diode	
D2	oERB44-08 or	Diode	
	oSM-1AH-10	Diode	
D3	oERB44-08 or	Diode	
	oSM-1AH-10	Diode	
D51	oESAB85-009	Diode	
D52	oRD22EB	Diode	
D53,54	o1SS118 or	Diode	
	1S954 or MA171	Diode	
D55	oRD5.1JSB	Diode	
D56	oRD4.3EB	Diode	
D57	oRD8.2EB	Diode	
R1	oYFRDF25S105J or	Carbon	1M ohms 1/4W
	oERD25FJ105	Carbon	1M ohms 1/4W
R2	oYF5D-11	Thermistor	5 ohms
R3	oYFRSF2B104J	Carbon	100K ohms 1/4W
R4	oYFRF50S1R0J	Carbon	1 ohms 1/2W
R5,6	oYFRSF1B104J	Carbon	100K ohms 1W
R7	oYFRSF1B1R8J or	Carbon	1.8 ohms 1W
	oYFRN11R8J	Carbon	1.8 ohms 1W
R8	oYFRSF1B150J or	Carbon	15 ohms 1W
	oYFRS1150J	Carbon	15 ohms 1W
R51	oYFRDF25S471J or	Carbon	470 ohms 1/4W
	oERD25FJ471	Carbon	470 ohms 1/4W
R52	oYFRDF25S104J or	Carbon	100K ohms 1/4W
	oERD25FJ104	Carbon	100K ohms 1/4W
R53	oYFRDF25S332J or	Carbon	3.3K ohms 1/4W
	oERD25FJ332	Carbon	3.3K ohms 1/4W
R54	oYFRDF25S562J or	Carbon	5.6K ohms 1/4W
	oERD25FJ562	Carbon	5.6K ohms 1/4W
R55	o3321P-1-502	Potentionmeter	5K ohms 1/2W
R56	oYFRDF25S472 or	Carbon	4.7K ohms 1/4W
	oERD25FJ472	Carbon	4.7K ohms 1/4W
R57	oYFRDF25S102J or	Carbon	1K ohms 1/4W
	oERD25FJ102	Carbon	1K ohms 1/4w
R58	oYFRDF25S223J or	Carbon	22K ohms 1/4W
	oERD25FJ223	Carbon	22K ohms 1/4W
R59	oYFRDF25S103J or	Carbon	10K ohms 1/4W
	oERD25FJ103	Carbon	10K ohms 1/4W
R60	oYFRDF25S102J or	Carbon	1K ohms 1/4W
	oERD25FJ102	Carbon	1K ohms 1/4W
R61	oYFRDF25S223J or	Carbon	22K ohms 1/4W
	oERD25FJ223	Carbon	22K ohms 1/4W
R62	oYFRDF25S560J or	Carbon	56K ohms 1/4W
	oERD25FJ560	Carbon	56K ohms 1/4W
C1 ⚠	oYFCFX22E224M or	Plastic	0.22 μF 250V
	oECQE2A224MW	Plastic	0.22 μF 250V
C2,3 ⚠	oCS13E2GA222 or	Ceramic	2200PF 400V
	oCK45E2GA222	Ceramic	2200PF 400V
C4 ⚠	oYFCFX22E104M or	Plastic	0.1 μF 250V
	oECQE2A104MW	Plastic	0.1 μF 250V
C5,6 ⚠	oCS13E2GA222 or	Ceramic	2200PF 400V
	oCK45E2GA222	Ceramic	2200PF 400V
C7	oLHS2G470QHSC	Electrolytic	47 μF 400V
C8	oYFMMH2J103	Plastic	0.01 μF 630V
C9	oYFAMZ1H473 or	Plastic	0.047 μF 50V
	oYFTDY1H473	Plastic	0.047 μF 50V
C10	oYFSXE50VB4R7	Plastic	4.7 μF 50V
C11	oYFAMZ1H472 or	Plastic	4700PF 50V
	oYFTDY1H472	Plastic	4700PF 50V
C51	oYFULB1E102 or	Electrolytic	1000 μF 25V
	YFSL25VB1000	Electrolytic	1000 μF 25V
C52	oYFULB1E470 or	Electrolytic	470 μF 25V
	oSL25VB470	Electrolytic	470 μF 25V
C53	oYFAMZ1H104 or	Plastic	0.1 μF 50V
	oYFTDY1H104	Plastic	0.1 μF 50V
C54,55	oCC45L1H101J	Ceramic	100PF 50V
C57	oYFAMZ1H102 or	Ceramic	1000PF 50V
	oYFTDY1H102	Ceramic	1000PF 50V
C59	oYFAMZ1H682 or	Ceramic	6800PF 50V
	oYFTDY1H682	Ceramic	6800PF 50V
L1 ⚠	oUF1922S-103Y	Inductor	10mH
L51	oYFCH166	Inductor	3 μH
L52	oYFCH365	Inductor	93μH
T1 ⚠	oYFMT1011	Power Transformer	
F1 ⚠	oYFBET1A	Fuse	1A 250V
E1	oYFH-0011-1	Fuse Holder	
CN1	oYF4EF9965	2P Terminal Block	
CN2	oYFP77-3P	3P Terminal Block	
M29	oYF2JF00A348B	Main Chassis	
M30	o YF4ER03068	Mounting Angle for TR	
M31	o YF4ER03072	Heat Sink	
M32 ⚠	o YF4ER03070	Insulator Sheet	

POWER BOARD for WV-PS31N

SYMBOL NO.	PART NO.	DESCRIPTION	
PCB3	oYFA348B	Printed Circuit Board Assy	
IC1 ⚠	oTLP531GR	IC	
Q1	2SC2655Y	Transistor	
Q2 ⚠	2SC945Q or 2SC945P	Transistor Transistor	
Q3 ⚠	2SA1020Y	Transistor	
Q4 ⚠	2SC2792	Transistor	
Q5,6	2SC945Q or 2SC945P	Transistor Transistor	
D1 ⚠	oKBPC606	Diode	
D2 ⚠	oRGP10K	Diode	
D4	o1SS118 or o1S954	Diode Diode	
D5	RD4.7EB2	Diode	
D6,7 ⚠	1SS118 or 1S954	Diode Diode	
D8 ⚠	RD4.7EB2	Diode	
D9 ⚠	ESAB82-004	Diode	
D10	RD5.1EB2	Diode	
R1	oYFMDS05N3R3J	Carbon	3.3 ohms 1/2W
R2	oYFRDF50S684J	Carbon	680K ohms 1/2W
R3	oYFRSF2B124J	Carbon	120K ohms 2W
R4	oYFRDF50S100J	Carbon	10 ohms 1/2W
R5	oYFRDF25S330J	Carbon	33 ohms 1/4W
R6	oYFRDF25S3R3J	Carbon	3.3 ohms 1/4W
R9	oYFRDF25S221J	Carbon	220 ohms 1/4W
R10,11	oYFRDF25S102J	Carbon	1K ohms 1/4W
R12	oYFRDF25S471J	Carbon	470 ohms 1/4W
R13	oYFRDF25S390J	Carbon	39 ohms 1/4W
R14	oYFRSF1BR82J	Carbon	0.82 ohms 1/4W
R16	oYFRDF25S2R2J	Carbon	2.2 ohms 1/4W
R17	oYFRDF25S562J	Carbon	5.6K ohms 1/4W
R18	oYFTM64K2B2K	Carbon	2K ohms 2W
R19	oYFRDF25S182J	Carbon	1.8K ohms 1/4W
R20	oYFRDF25S101J	Carbon	100 ohms 1/4W
R21	oYFRDF25S471J	Carbon	470 ohms 1/4W
R22 ~ 24	oYFRDF25S102J	Carbon	1K ohms 1/4W
C1 ⚠	ECQE2A104MW	Plastic	0.1 μF 250V
C2 ~ 5 ⚠	oCK45E2GA102	Ceramic	1000 pF 400V
C6	ECQE2A104MW	Plastic	0.1 μF 250V
C7,8 ⚠	oCK45E2GA102	Ceramic	1000 pF 400V
C9	o400VBSN47	Plastic	47 μF 400V
C10	ECQM6102KZ	Plastic	1000 pF 600V
C11	oAMR2G103KDY	Plastic	0.01 μF 200V
C12	oCK45B3A221KY	Ceramic	220 pF 400V
C13	oYFAMX1H153KV	Plastic	0.015 μF 50V
C14	oSXA25VB-100	Plastic	100 μF 25V
C15,16	o25ULB680VM	Plastic	68 μF 25V
C17	o25ULB330VM	Plastic	33 μF 25V
C18	oYFAMX1H104KV	Plastic	0.1 μF 50V
C21	oYFSL50VB10	Electrolytic	10 μF 50V
L1 ⚠	oUF1817S-103Y	Choke Coil	
L2,3	oRH5.2X9X1.70	Bead Ferrite	
L4	oYFCH166	Inductor	3 μH
L5	oYFCH365	Inductor	93 μH
T1 ⚠	oYFMT729	Power Transformer	
F1 ⚠	oYFBET-2A	Fuse	2A
E1	oYFH-0011-1	Fuse Holder	
CN1	oYF4EF9965	2p Terminal Block	
CN2	oYFP77-2P	2p Terminal Block	
M29	oYF2JF00A348B	Main Chassis	
M30	oYF4ER03068	Mounting Angle for Transistor	
M31	oYF4ER03072	Heat Sink	
M32	oYF4ER03070	Insulator Sheet	

ACCESSORY PARTS/PACKAGING PARTS

SYMBOL NO.	PART NO.	DESCRIPTION
M41	o YFV8QA0864AN o YFV8QA0865AN	Operating Instruction for WV-PS31/BCG Operating Instruction for WV-PS31N, WV-PS31NA
M42	19998700331 19998700419	Warranty Card for WV-PS31/B Warranty Card for WV-PS31/G
M45	XZB26X40C05	Polyethylene Bag
M46	o YFV9CA0686AN o YFV9CA0687AN	Packaging for WV-PS31/BCG Packaging for WV-PS31N, WV-PS31NA

BATTERY PACK WV-PS33

MISCELLANEOUS

SYM-BOL NO.	PART NO.	DESCRIPTION
BAT1	oP-35-10A05P	Storage Battery
CN1	YWQMA1221B	DC Jack
M1	YFV5KB0066A1	Upper Case
M2	YFV5EA0334A4	Sub-Cover for Upper Case
M3	o YFV2CA0093A4	Hold Plate for Lever
M4	o YFV2EA0034A4	Guide
M5	YFV6JA0012A4	BLock Button
M6	YFV4JA0083A4	Spring
M7	o YFV5EB0332A1	Rear Cover
M8	YFV4JA0082A4	Spring
M9	YFV4JA0084A4	Spring
M10	YFV1HA0016A4	Pin
M11	YFV5MA0013A4	Shoe
M12	oYFV2FA0106A4	Cushion
M13	oYFV2FA0107A4	Cushion
M14	oYFV2SA0209A4	Mounting Angle
M15	YWSR2P4	Cord Clamp
M16	oYFV7QA0865A4	Main Label
M17	YFV7MA0099A4	Safety Label
M18	YFV7SA0265A4	Operation Label
M19	YFV7MA0194A4	Charge Label

ACCESSORY PARTS/PACKAGING PARTS

SYM-BOL NO.	PART NO.	DESCRIPTION
M21	oYFV8QA0861AN	Operating Instruction
M22	YFV8SA0009CN	Polyethylene Bag
M23	XZB26X40C05	Polyethylene Bag
M25	oYFV9CA0683AN	Packaging

RCU/GEN-LOCK ADAPTOR WV-AD33

MISCELLANEOUS

SYM-BOL NO.	PART NO.	DESCRIPTION
CN8	BNC-BRZ-1S	BNC Connector
CN9	o YFVEE014B	14 pin RCU Connector
CN10	YWLJ194-1-1	Intercam Jack
M1	o YFV1EA0051A4	Special Screw A
M2	o YFV1EB0051A4	Special Screw B
M3	o YFV2JA0010A4	Mounting Spacer
M4	YWA620ER01	Insulator Washer
M5	YFV7MA0099A4	Safety Label
M6	YFV5EA0335B1	Rear Cover
M7	o YFV5KA0067C1	Upper Case
M8	o YFV6FA0044A4	Mounting Bracket for Connector
M11	YWE5100EM01	Special Screw C (x2)
M12 ⚠	YFV7SA0277A4	Fuse Label
M13	o YFV5WA0237A4	Indicator Panel
M14	o YFV5WA0242A4	BL Panel
M15	o YFV5WA0239A4	GL Panel
M16 ⚠	o YFV7MA0940A4	Main Label for WV-AD33E
	o YFV7MA0941A4	Main Label for WV-AD33N

RCU CONTROL BOARD

SYM-BOL NO.	PART NO.	DESCRIPTION	
PCB1	o YFVKBAD33P1A	Printed Circuit Board Assy	
IC1	NJM2904M	IC	
IC2	NJU4051BM	IC	
IC3,4	YFNJM064M	IC	
IC5	MB84066BF	IC	
IC6	NJU4053BM	IC	
IC7	YFMB84024BF	IC	
IC8	YFNJU4011BM	IC	
Q1	YF2SB953A-PQ	Transistor	
Q2	2SC1318-RS	Transistor	
Q3	2SA1037K7QRS	Transistor	
Q4	2SD973-QRS	Transistor	
Q9,10	2SA1037K7QRS	Transistor	
Q11	2SC2412K7QRS	Transistor	
Q13	2SA1022-BC	Transistor	
Q14	2SC2404-CD	Transistor	
Q18	2SA1037K7QRS	Transistor	
Q19,20	2SC2412K7QRS	Transistor	
Q21	2SA1037K7QRS	Transistor	
Q22,23	2SC2404-CD	Transistor	
Q24	2SA1037K7QRS	Transistor	
D1	MA3056HTW	Diode	
D3	GL-3PR7H	Diode	
D4	GL-3HY7H	LED	
D5	DAP202KT7	Diode	
D6-8	MA151K	Diode	
D10	MA165	Diode	
R1	YF2116103JT	Carbon	10K ohms 1/16W
R4	YF2116133JT	Carbon	13K ohms 1/16W
R5	YF2116622JT	Carbon	6.2K ohms 1/16W
R7	YF2116103JT	Carbon	10K ohms 1/16W
R8	ERG1SJ331	Metal	330 ohms 1/16W
R9	YF2116560JT	Carbon	56 ohms 1/16W
R10	YF2116471JT	Carbon	470 ohms 1/16W
R11,12	YF2116102GT	Carbon	1K ohms 1/16W
R13	ERD10TJ221	Carbon	220 ohms 1/8W
R15,17	YF2116103JT	Carbon	10K ohms 1/16W
R28	ERD10TJ162T	Carbon	1.6K ohms 1/8W
R30	YF2116331JT	Carbon	330 ohms 1/16W
R31-33	YF2116103JT	Carbon	10K ohms 1/16W
R35	YF2116223JT	Carbon	22K ohms 1/16W
R36	YF2116103JT	Carbon	10K ohms 1/16W
R37	ERD10TJ103	Carbon	10K ohms 1/8W
R38	YF2116101JT	Carbon	100 ohms 1/16W
R39	YF2116680JT	Carbon	68 ohms 1/16W
R40	YF2116471JT	Carbon	470 ohms 1/16W
R42	YF2116222GT	Carbon	2.2K ohms 1/16W
R43	YF2116101JT	Carbon	100 ohms 1/16W
R44	YF2116103JT	Carbon	10K ohms 1/16W
R46	YF2116912GT	Carbon	9.1K ohms 1/16W
R47	YF2116223JT	Carbon	22K ohms 1/16W
R48	YF2116473GT	Carbon	47K ohms 1/16W
R50	YF2116750JT	Carbon	75 ohms 1/16W

SYM-BOL NO.	PART NO.	DESCRIPTION	
R63	YF2116122JT	Carbon	1.2K ohms 1/16W
R64	YF2116104JT	Carbon	100K ohms 1/16W
R65	YF2116103JT	Carbon	10K ohms 1/16W
R66	YF2116223JT	Carbon	22K ohms 1/16W
R67,68	YF2116333GT	Carbon	33K ohms 1/16W
R69,70	YF2116132JT	Carbon	1.3K ohms 1/16W
R71,72	YF2116682JT	Carbon	6.8K ohms 1/16W
R73	YF2116333GT	Carbon	33K ohms 1/16W
R74	YF2116683GT	Carbon	68K ohms 1/16W
R75,76	YF2116223JT	Carbon	22K ohms 1/16W
R77	YF2116562JT	Carbon	5.6K ohms 1/16W
R78	YF2116333GT	Carbon	33K ohms 1/16W
R79	YF2116223JT	Carbon	22K ohms 1/16W
R80	YF2116562JT	Carbon	5.6K ohms 1/16W
R81	YF2116470JT	Carbon	47 ohms 1/16W
R82	YF2116103JT	Carbon	10K ohms 1/16W
R83,84	YF2116473GT	Carbon	47K ohms 1/16W
R85-87	YF2116104JT	Carbon	100K ohms 1/16W
R100	YF2116223JT	Carbon	22K ohms 1/16W
R101	YF2116331JT	Carbon	330 ohms 1/16W
R102	ERD10TJ271	Carbon	270 ohms 1/8W
R103	YF2116102GT	Carbon	1K ohms 1/16W
R110	ERD10TJ101	Carbon	100 ohms 1/8W
VR1	EVJFHAE20B13	Variable Resistor	1K ohms
C1,3	ECEA1EU470	Electrolytic	47 µF 25V
C4	ECEA1CU470	Electrolytic	47 µF 16V
C5	ECEA1CU100	Electrolytic	10 µF 16V
C6,7	ECEA1AU470	Electrolytic	47 µF 10V
C9	ECEA1AU101	Electrolytic	100 µF 10V
C10	ECEA1AU470	Electrolytic	47 µF 10V
C11-15	YF400104FZT	Ceramic	0.1 µF
C16	ECEA1AU470	Electrolytic	47 µF 10V
C18	ECEA1AU101	Electrolytic	100 µF 10V
C19-22	YF400104FZT	Ceramic	0.1 µF
C27	YF400104FZT	Ceramic	0.1 µF
C28	ECEA1HS010S	Electrolytic	1 µF 50V
C29	ECEA1AU101	Electrolytic	100 µF 10V
C30	YF400330SLJT	Ceramic	33 pF
C31	YF400680SLJT	Ceramic	68 pF
C32	YF400103XKT	Ceramic	0.01 µF
C100	YF400102SLJT	Ceramic	1000 pF
C101	ECEA1HSN010	Electrolytic	1 µF 50V
C110	ECEA1AU101	Electrolytic	100 µF 10V
F1 ⚠	YFSP73A	Current Fuse	3A
CN1-JM	YFS10PS2T2EF	10 pin Jack Male	
CN2-JM	S2PS2T2EF	2 pin Jack Male	
CN3-JM	S3PS2T2EF	3 pin Jack Male	
CN4-JM	YFS11PS2T2EF	11 pin Jack Male	
CN5-JM	YFS6PS2T2EF	6 pin Jack Male	
CN6-JM	S3PS2T2EF	3 pin Jack Male	
CN7-JM	YFILG3PS3T2E	3 pin Jack Male	

CONNECTOR BOARD

PCB2	o YFVKCAD33P1A	Printed Circuit Board Assy
CN1	o YFXC5B3221	32 pin Multi-pin Connector
M17	o YFV2NA0058A4	Spacer for Multi-pin Connector

GEN-LOCK BOARD

SYM-BOL NO.	PART NO.	DESCRIPTION	
PCB3	o YFVKZAD33E1A	Printed Circuit Board Assy	
IC1	MN74HC02S	IC	
IC2	TC40H002F	IC	
IC3	MP7260A	IC	
IC4	MN74HC221S	IC	
IC5	MN74HC4050S	IC	
Q1	2SC2412K7QRS	Transistor	
Q2	2SB709-Q	Transistor	
Q3	2SD601-QR	Transistor	
Q4-6	2SC2412K7QRS	Transistor	
Q7	2SC641K-C	Transistor	
Q8	2SC2412K7QRS	Transistor	
Q9	2SB709-Q	Transistor	
Q10	2SC641K-C	Transistor	
Q11	2SC2412K7QRS	Transistor	
Q12	2SC2404-CD	Transistor	
Q13	2SA1037K7QRS	Transistor	
Q14	2SC2404-CD	Transistor	
Q15	2SA1037K7QRS	Transistor	
D1	MA165	Diode	
D2-4	MA328	Diode	
D5	MA151K	Diode	
R1,2	ERJ8GCSJ223	Carbon	22K ohms 1/8W
R3	ERJ8GCSG821	Carbon	820 ohms 1/8W
R4	ERJ8GCSJ102	Carbon	1K ohms 1/8W
R5	ERJ8GCSJ103	Carbon	10K ohms 1/8W
R6,7	ERJ8GCSJ331	Carbon	330 ohms 1/8W
R8	ERJ8GCSG272	Carbon	2.7K ohms 1/8W
R9	ERJ8GCSG123	Carbon	12K ohms 1/8W
R10	ERJ8GCSG122	Carbon	1.2K ohms 1/8W
R11	ERJ8GCSJ152	Carbon	1.5K ohms 1/8W
R12	ERJ8GCSJ222	Carbon	2.2K ohms 1/8W
R13	ERJ8GCSJ102	Carbon	1K ohms 1/8W
R14	ERJ8GCSG332	Carbon	3.3K ohms 1/8W
R15	ERJ8GCSJ102	Carbon	1K ohms 1/8W
R16	ERJ8GCSJ561	Carbon	560 ohms 1/8W
R17	ERJ8GCSG123	Carbon	12K ohms 1/8W
R18	ERJ8GCSJ152	Carbon	1.5K ohms 1/8W
R19	ERJ8GCSJ102	Carbon	1K ohms 1/8W
R20	ERJ8GCSJ561	Carbon	560 ohms 1/8W
R21	ERJ8GCSG622	Carbon	6.2K ohms 1/8W
R22	ERJ8GCSJ104	Carbon	100K ohms 1/8W
R23	ERJ8GCSJ472	Carbon	4.7K ohms 1/8W
R24	ERJ8GCSJ103	Carbon	10K ohms 1/8W
R25,26	ERJ8GCSJ222	Carbon	2.2K ohms 1/8W
R27	ERJ8GCSJ822	Carbon	8.2K ohms 1/8W
R28	ERJ8GCSJ182	Carbon	1.8K ohms 1/8W
R29	ERJ8GCSJ222	Carbon	2.2K ohms 1/8W
R30	ERJ8GCSG101	Carbon	100 ohms 1/8W
R31	ERJ8GCSJ104	Carbon	100K ohms 1/8W
R32	ERJ8GCSG333	Carbon	33K ohms 1/8W
R33	ERJ8GCSG221	Carbon	220 ohms 1/8W
R34	ERJ8GCSG101	Carbon	100 ohms 1/8W
R35	ERJ8GEYJ105V	Carbon	1M ohms 1/8W

SYMBOL NO.	PART NO.	DESCRIPTION	
R36	ERJ8GCSJ102	Carbon	1K ohms 1/8W
R37	ERJ8GCSJ104	Carbon	100K ohms 1/8W
R38	ERJ8GCSG333	Carbon	33K ohms 1/8W
R39,40	ERJ8GCSJ103	Carbon	10K ohms 1/8W
R42	ERJ8GCSJ104	Carbon	100K ohms 1/8W
R43	ERJ8GCSG333	Carbon	33K ohms 1/8W
R44,45	ERJ8GCSG101	Carbon	100 ohms 1/8W
R46	ERJ8GCSJ102	Carbon	1K ohms 1/8W
R47	ERJ8GCSJ222	Carbon	2.2K ohms 1/8W
R48	ERJ8GCSJ562	Carbon	5.6K ohms 1/8W
R50	ERJ8GCSJ102	Carbon	1K ohms 1/8W
R51	ERJ8GCSJ751	Carbon	750 ohms 1/8W
R52	ERJ8GCSJ182	Carbon	1.8K ohms 1/8W
R53	ERJ8GCSJ472	Carbon	4.7K ohms 1/8W
R54,55	ERJ8GCSJ561	Carbon	560 ohms 1/8W
R56	ERJ8GCSJ102	Carbon	1K ohms 1/8W
R57	ERJ8GCSG221	Carbon	220 ohms 1/8W
R58,59	ERJ8GCSJ102	Carbon	1K ohms 1/8W
R60	ERJ8GCSJ472	Carbon	4.7K ohms 1/8W
R61,62	ERJ8GCSJ561	Carbon	560 ohms 1/8W
R63	ERJ8GCSJ102	Carbon	1K ohms 1/8W
R64	ERJ8GCSG221	Carbon	220 ohms 1/8W
R65	ERJ8GCSJ102	Carbon	1K ohms 1/8W
R78	ERJ8GCSJ682	Carbon	6.8K ohms 1/8W
R79	ERJ8GCSJ102	Carbon	1K ohms 1/8W
R80	ERJ8GCSJ682	Carbon	6.8K ohms 1/8W
R81	ERJ8GCSJ102	Carbon	1K ohms 1/8W
VR1	YF6M2L1K	Variable Resistor	1K ohms
VR2	YF6M2L5K	Variable Resistor	5K ohms
VR3,4	YFH0621A100K	Variable Resistor	100K ohms
C1,2	ECEA1AU470	Electrolytic	47 μF 10V
C3	YF426681SLKS	Ceramic	680 pF 50V
C4	YF426151CHJS	Ceramic	150 pF 50V
C5	YF426103XMS	Ceramic	10000 pF 50V
C6	YF426222XKS	Ceramic	2200 pF 50V
C7	ECSF1CE336	Tantalum	33 μF 16V
C8	YF426103XMS	Ceramic	10000 pF 50V
C9	ECEA1HU4R7	Electrolytic	4.7 μF 50V
C10	YF426221SLKS	Ceramic	220 pF 50V
C11	ECSF1AE336	Tantalum	33 μF 10V
C12	YF426180CHJS	Ceramic	18 pF 50V
C14	YF426221SLKS	Ceramic	220 pF 50V
C15	YF426102CHJS	Ceramic	1000 pF 50V
C16	ECEA1AU470	Electrolytic	47 μF 10V
C17	ECSF1AE336	Tantalum	33 μF 10V
C18	YF426220CHKS	Ceramic	22 pF
C19	YF426102CHJS	Ceramic	1000 pF 50V
C20	YF426220CHKS	Ceramic	22 pF
C21	YF426470SLKS	Ceramic	47 pF 50V
C22	YF426222XKS	Ceramic	2200 pF 50V
C23	YF426224FZS	Ceramic	0.22 μF 50V
C24,25	YF426101CHJS	Ceramic	100 pF 50V
C26	ECQM1H563JZ	Plastic	0.056 μF 50V
C27	YF426223XKS	Ceramic	0.022 μF 50V
C28	YF426221SLKS	Ceramic	220 pF 50V
C29	YF426330CHJS	Ceramic	33 pF 50V

SYMBOL NO.	PART NO.	DESCRIPTION	
C31	YF426120CHKS	Ceramic	12 pF
C32	YF426150CHJS	Ceramic	15 pF 50V
C33	ECSF1CE106	Tantalum	10 μF 16V
C34	YF426101CHJS	Ceramic	100 pF 50V
C35	YF426221SLKS	Ceramic	220 pF 50V
C36	YF426270CHJS	Ceramic	27 pF 50V
C37,38	YF426390CHJS	Ceramic	39 pF 50V
C39	ECEA1AU470	Electrolytic	47 μF 10V
C43	ECSF1AE336	Tantalum	33 μF 10V
C44	ECSF1CE336	Tantalum	33 μF 16V
C45	YF426100CHDS	Ceramic	10 pF 50V
C50,51	YF426103XMS	Ceramic	0.01 μF
CT1-5	YFTZ03R300FR	Trimmer	30 pF
L1	EL05SI470K	Coil	47 μH
L2	EL05SI100K	Coil	10 μH
L3	EL05SI470K	Coil	47 μH
L4	YFCSL094R7K	Coil	4.7 μH
L5	EL05SI8R2K	Coil	8.2 μH
L6,7	EL05SI330K	Coil	33 μH
SW1,2	YFSSJ312AN	Slide Switch	
X1	YFKD3246KAB	Crystal Oscillator	
X2,3	YFKD2034KDB	Crystal Oscillator	
CN1-JM	YFS9PS2T2EF	9 pin Jack Male	
CN2-JM	YFS7PS2T2EF	7 pin Jack Male	
CN3-JM	YFS8PS2T2EF	8 pin Jack Male	

ACCESSORY PARTS/PACKAGING PARTS

M21	o YFV8QA0913AN	Operating Instruction for WV-AD33E
	o YFV8QA0914AN	Operating Instruction for WV-AD33N
M24	YWT20X25C03	Polyethylene Bag
M25	YFV9CB0723AN	Packaging
M26	YFV8FA0002A4	Packing Label for WV-AD33E
	YNL1E	Packing Label for WV-AD33N

CHEST PAD WV-Q30

MISCELLANEOUS

M1	YFV4AA0013A1	Chest Arm
M2	YFV2CA0097A4	Push Plate for Gear A
M3	YFV4EA0006A3	Gear 2
M4	YFV4EA0007A3	Gear 1
M5	YFV2EA0036A1	Gear Guide
M6	YFV4JA0110A4	Coil Spring
M7	YFV5RA0066A3	Lock Knob
M8	YFV5VA0040A3	Chest Pad
M9	YFV7QA0957A4	Main Label
M10	YFV4JA0109A4	Spring Plate for Arm

ACCESSORY PARTS/PACKAGING PARTS

M14	XSS26X8FZK	Flush Head Machine Black Screws

SYMBOL NO.	PART NO.	DESCRIPTION
M15	o YFV8QA0936AN	Operating Instruction
M16	YWT20X25C03	Polyethylene Bag for Chest Pad
M17	YWT050803	Polyethylene Bag for Screws
M18	o YFV9CCD723AN	Packaging
M19	YFV8FA0002A4	Packing label

TRIPOD MOUNTING ADAPTOR WV-Q36

MISCELLANEOUS

SYMBOL NO.	PART NO.	DESCRIPTION
M1	YFV2CA0098B2	Mounting Plate
M2	YFV6FA0045A3	Lock Mounting Bracket
M3	YFV6FA0046A4	Mounting Angle
M4	YFV6GA0035A2	Mounting Base
M5	YFV4HA0008A4	Lock Lever Shaft
M6	YFV4HA0009A4	Lock Knob
M7	YFV4RA0013A3	Lock Lever
M8	YFV2NA0062A4	Lock Spacer
M9	YFV2NA0063A4	Lock Washer
M10	YFV4JA0111A4	Coil Spring A for Lock
M11	YFV4JA0112A4	Spring Plate A
M12	YFV4JA0113A4	Spring Plate B
M13	YFV4JA0114A4	Coil Spring B for Lever
M14	o YFV7QA0961A4	Main Label
M15	YFV1EA0052A4	Special Screw for Lock
M16	YFV1FA0023A4	Slide Nut
M17	YFV4SA0002A4	Steel Ball
M18	YFV4SA0003A4	Roller for Lock

ACCESSORY PARTS/PACKAGING PARTS

SYMBOL NO.	PART NO.	DESCRIPTION
M21	o YFV8QA0942AN	Operating Instruction
M22	XZB26X40C05	Polyethylene Bag
M23	YFV9CB0744AN	Packaging
M24	o YFV8FA0002A4	Packing Label

REMOTE CONTROL UNIT WV-RC33

MISCELLANEOUS

SYMBOL NO.	PART NO.	DESCRIPTION
Q1 ⚠	2SB941-PQR	Transistor
Q4	o 2SB946-PQ	Transistor
D101	LN21RPH	LED (Red)
D102	LN31-GCP	LED (Green)
R001,002	ERD25FJ750	Carbon 75 ohms 1/4W
VR1	o EVHC0AP15B13	Intercom Variable Resistor 1K ohms
VR2	o EVHC0HP20B14	Iris Variable Resistor 10K ohms
T1 ⚠	o YFPHB76V033	Power Transformer
SW1	ESD391T	AC/DC Select Switch
SW2 ⚠	EST1542R	Power Switch
SW3, 4	YSTS-J0282-4	Slide Switch
F1 ⚠	XBA2C31ET0	Current Fuse 3.15A
F2 ⚠	YWST6-1R5A	Current Fuse 1.5A
CN1	YWHBS-3-08	Power Cord for WV-RC33/B
	YWCE0099-08F	Power Cord for WV-RC33/C
	YWVM0099-08	Power Cord for WV-RC33/G
	YWCE0099-08F	Power Cord for WV-RC33N
	YWKPGTSA-3	Power Cord for WV-RC33NA
CN22	YFXLR-4-32F	Connector
CN23~28	YWBNC-R	Connector
CN29	RP519RB14SR	14 pin Camera Cable Connector
CN30	YFCNR-1204J	Socket
CN31	YWLJ194-1-1	Jack
E1	YWXN1153-07	Fuse Holder
M1	o YFV5WA0241A2	Rear Panel
M2	o YFV5EA0336A2	Side Cover
M3	o YFV2KA0127A2	Chassis
M4	o YFV5WA0240A2	Front Panel for WV-RC33N, WV-RC33NA
	o YFV5WB0240A2	Front Panel for WV-RC33/BCG
M5	o YFV2KA0129A2	Power Chassis
M6	o YFV2SA0211A4	Mounting Angle A
M7	o YFV2SA0212A4	Mounting Angle B
M8	o YFV5EA0338A2	Bottom Cover
M9	YWA620AER01	Insulator Washer (x2)
M10	YW-BCG-UR01B	Earth Label
M12	YFV7MA0200A4	Fuse Rated Label A
M13	YFV7DA0002B4	Heat Sink
M14	YWJ800PWB01	Parts Holder
M15	o YFV5EA0337A2	Upper Cover
M16	o YFV5DA0005A4	Ornament Handle A
M17	YWV8310HM02	Ornament Handle B
M18	YWB350-HM01	Ornament Handle C
M19	YWU-L88HA	Lack Angle
M20	YFV7MA0091A4	Fuse Rated Label B
M21	o YFV6JA0036A4	Push Button
M22	YFV3AA0014A4	Felt
M23	YWSR6W-1	Cord Bushing
M24	YWV5350WB01	Rubber Foot
M25 ⚠	o YFV7QA0945A4	Main Label for WV-RC33/B
⚠	o YFV7QA0946A4	Main Label for WV-RC33/C
	o YFV7QA0949A4	Main Label for WV-RC33/G
	o YFV7QA0947A4	Main Label for WV-RC33N
	o YFV7QA0948A4	Main Label for WV-RC33NA
M26 ⚠	YFV7MB0104A4	UL Caution Label
M36	YFV5RA0012A3	Knob A
M37	YFV5RC0004A4	Knob of Blue
M38	YFV5RB0004A4	Knob of Red
M39	YWV3801HR01	Knob of Black
M40	o YFV2FA0046A4	Upper Cover Cushion

POWER BOARD

SYMBOL NO.	PART NO.	DESCRIPTION
PCB1	o YFVKBRC33P1A	Printed Circuit Board Ass'y
IC1 ⚠	NJM3524D	IC
Q2 ⚠	2SC1567-QRS	Transistor
Q3 ⚠	o 2SA794-QRS	Transistor
D1 ⚠	M4C52-13	Diode

SYM-BOL NO.	PART NO.	DESCRIPTION	
D2	o ESAB82-004	Diode	
D3 ⚠	MA4100L	Diode	
D4	RM4ZLFK1	Diode	
D5	MA4062M	Diode	
D10	MA165	Diode	
R1	ERD10TJ102	Carbon	1K ohms 1/8W
R2	ERD10TJ511	Carbon	510 ohms 1/8W
R3,4	ERD10TJ472	Carbon	4.7K ohms 1/8W
R6	ERD10TJ682	Carbon	6.8K ohms 1/8W
R8	ERD10TJ102	Carbon	1K ohms 1/8W
R9	ERG2ANJ331H	Metal	330 ohms 2W
R11	ERD10TJ682	Carbon	6.8K ohms 1/8W
VR1	EVN8ACA00BE3	Variable Resistor	2.2K ohms
VR2	EVN8ACA00BE4	Variable Resistor	22K ohms
C1	ECKD2H103KB2	Ceramic	0.01 μF 500V
C2	o ECES1HU472R	Electrolytic	4700 μF 50V
C3	ECEA1AK470	Electrolytic	47 μF 10V
C4	o ECCF1H331JC	Ceramic	330 pF 50V
C6	ECQV1H224JZ	Plastic	0.22 μF 50V
C8	ECQV1H473JZ	Plastic	0.047 μF 50V
C9,10	ECET25R222SU	Electrolytic	2200 μF 25V
C11	ECEA1CF221	Electrolytic	220 μF 16V
C12,13	ECKD2H103KB2	Ceramic	0.01 μF 500V
C14,15	ECEA1EK100	Electrolytic	10 μF 25V
L1	YF15PF470K	Coil	47 μH
L2	YF15PV331K	Coil	330 μH
L3	YF15PF470K	Coil	47 μH
F2 ⚠	XBA1C30NU100	Fuse	3A 125V
FS1 ⚠	YFICPF75	Current Fuse	2.7A 150V
CN1-3	YFILG3PS3T2E	3 Pin Connector	
CN5	YFILG3PS3T2E	3 Pin Connector	
E2	YWSN5053	Fuse Holder	
M30	o YFV2SA0215A4	Earth Lag	

SC BOARD

SYM-BOL NO.	PART NO.	DESCRIPTION	
PCB2	o YFVKCRC33P1A	Printed Circuit Board Assy	
Q1-6	2SC828-QRS	Transistor	
R1	ERD10TJ822	Carbon	8.2K ohms 1/8W
R2	ERD10TJ392	Carbon	3.9K ohms 1/8W
R3,4	ERD10TJ561	Carbon	560 ohms 1/8W
R5	ERD10TJ101	Carbon	100 ohms 1/8W
R6	ERD10TJ152	Carbon	1.5K ohms 1/8W
R7	ERD10TJ221	Carbon	220 ohms 1/8W
R8	ERD10TJ151	Carbon	150 ohms 1/8W
R9	ERD10TJ822	Carbon	8.2K ohms 1/8W
R10	ERD10TJ392	Carbon	3.9K ohms 1/8W
R11,12	ERD10TJ561	Carbon	560 ohms 1/8W
R13	ERD10TJ271	Carbon	270 ohms 1/8W
R14	ERD10TJ152	Carbon	1.5K ohms 1/8W
R15	ERD10TJ822	Carbon	8.2K ohms 1/8W
R16	ERD10TJ392	Carbon	3.9K ohms 1/8W
R17	ERD10TJ181	Carbon	180 ohms 1/8W
R18,19	ERD10TJ561	Carbon	560 ohms 1/8W
R20	ERD10TJ152	Carbon	1.5K ohms 1/8W
VR1	EVN8ACA00B13	Variable Resistor	1K ohms

SYM-BOL NO.	PART NO.	DESCRIPTION	
VR2	o EVJKBAS20B13	Variable Resistor	IK ohms
C1,2	ECQB1H103JZ	Plastic	0.01 μF 50V
C3	ECQP1101JZ	Plastic	100 pF 100V
C4	ECQB1H103JZ	Plastic	0.01 μF 50V
C5	ECQP1101JZ	Plastic	100 pF 100V
SW1	YFSBU1024	Rotary Switch	
M41	o YFV2SA0216A4	Mounting Angle for Variable Resistor	

VIDEO BOARD

SYM-BOL NO.	PART NO.	DESCRIPTION
PCB3	o YFVKZRC33E1A	Printed Circuit Board Assy
IC1	HD14001BP	IC
IC2	YFHD14538BP	IC
IC3	NJM3414D	IC
IC4	NJM2048MC	IC
IC5	NJM4558DFD	IC
IC7	o YFMB84051	IC
IC8	o MB84024	IC
IC9,10	o MB84021	IC
IC11	o YFNJM386D	IC
IC12	o YFNJM319D	IC
Q1	2SC828-QRS	Transistor
Q2	2SA838-BC	Transistor
Q3-5	2SC828-QRS	Transistor
Q6	2SC641K-C	Transistor
Q13	2SC828-QRS	Transistor
Q14	2SC1383	Transistor
Q15	2SA683-PQ	Transistor
Q16	2SC1317-RS	Transistor
Q17 ⚠	2SB929-PQ	Transistor
Q20	2SC1383	Transistor
Q21-24	2SC828-QRS	Transistor
Q25	2SC1383	Transistor
Q26	2SA683-PQ	Transistor
Q27	2SC1047-CD	Transistor
Q28	2SC828-QRS	Transistor
Q29	2SC1047-CD	Transistor
Q30	2SC828-QRS	Transistor
Q31,34	2SC1047-CD	Transistor
Q35	2SC1047-CD	Transistor
Q36-38	2SA564-QRS	Transistor
Q39-41	2SA838-BC	Transistor
Q42,43	2SC1047-CD	Transistor
Q44,45	2SC828-QRS	Transistor
Q48	2SA838-BC	Transistor
Q49,50	2SC1047-CD	Transistor
Q51	2SA838-BC	Transistor
Q55,56	2SC828-QRS	Transistor
Q57	2SA564-QRS	Transistor
Q58-62	2SC828-QRS	Transistor
Q63	2SC1327-RS	Transistor
Q64	2SA721-RS	Transistor
Q65	2SC828-QRS	Transistor
Q66,67	2SA564-QRS	Transistor

SYMBOL NO.	PART NO.	DESCRIPTION	
Q68	2SA838-BC	Transistor	
D1-4	MA165	Diode	
D5	EK14	Diode	
D6-10	MA165	Diode	
TH1	ERTD2FHL103S	Thermistor	
R1	ERD10TJ473	Carbon	47K ohms 1/8W
R2	ERD10TJ223	Carbon	22K ohms 1/8W
R3	ERD10TJ331	Carbon	330 ohms 1/8W
R4	ERD10TJ222	Carbon	2.2K ohms 1/8W
R5	ERD10TJ563	Carbon	56K ohms 1/8W
R6	ERD10TJ224	Carbon	220K ohms 1/8W
R7	ERD10TJ472	Carbon	4.7K ohms 1/8W
R8	ERD10TJ103	Carbon	10K ohms 1/8W
R9	ERD10TJ101	Carbon	100 ohms 1/8W
R10	ERD10TJ222	Carbon	2.2K ohms 1/8W
R11	ERD10TJ820	Carbon	82 ohms 1/8W
R12	ERD10TJ331	Carbon	330 ohms 1/8W
R13	ERD10TJ471	Carbon	470 ohms 1/8W
R14	ERD10TJ183	Carbon	18K ohms 1/8W
R15	ERD10TJ222	Carbon	2.2K ohms 1/8W
R16	ERD10TJ272	Carbon	2.7K ohms 1/8W
R17	ERD10TJ152	Carbon	1.5K ohms 1/8W
R18	ERD10TJ682	Carbon	6.8K ohms 1/8W
R39	ERD10TJ622	Carbon	6.2K ohms 1/8W
R40	ERD10TJ102	Carbon	1K ohms 1/8W
R41	ERD10TJ822	Carbon	8.2K ohms 1/8W
R42	ERD10TJ103	Carbon	10K ohms 1/8W
R43	ERD10TJ222	Carbon	2.2K ohms 1/8W
R44,45	ERD10TJ2R2	Carbon	2.2 ohms 1/8W
R46	ERD10TJ223	Carbon	22K ohms 1/8W
R47	ERD10TJ750	Carbon	75 ohms 1/8W
R48	ERD10TJ103	Carbon	10K ohms 1/8W
R49	ERD10TJ223	Carbon	22K ohms 1/8W
R50,51	ERD10TJ103	Carbon	10K ohms 1/8W
R52	ERD10TJ391	Carbon	390 ohms 1/8W
R53,54	ERD10TJ100	Carbon	10 ohms 1/8W
R55	ER0S2CKF3301	Metal	3.3K ohms 1/8W
R56	ER0S2CKF8201	Metal	8.2K ohms 1/8W
R57	ERD10TJ221	Carbon	220 ohms 1/8W
R58	ERD10TJ222	Carbon	2.2K ohms 1/8W
R59	ERD10TJ273	Carbon	27K ohms 1/8W
R60	ERD10TJ272	Carbon	2.7K ohms 1/8W
R61	ERD10TJ391	Carbon	390 ohms 1/8W
R62	ERD10TJ222	Carbon	2.2K ohms 1/8W
R63	ER0S2CKF1502	Metal	15K ohms 1/8W
R64	ER0S2CKF1002	Metal	10K ohms 1/8W
R65	ERD10TJ562	Carbon	5.6K ohms 1/8W
R66	ERD10TJ102	Carbon	1K ohms 1/8W
R67	ERD10TJ752	Carbon	7.5K ohms 1/8W
R68	ERD10TJ101	Carbon	100 ohms 1/8W
R69	ERD10TJ332	Carbon	3.3K ohms 1/8W
R70	ERD10TJ823	Carbon	82K ohms 1/8W
R71	ERD10TJ102	Carbon	1K ohms 1/8W
R72	ERD10TJ100	Carbon	10 ohms 1/8W
R73	ERD10TJ101	Carbon	100 ohms 1/8W
R74	ERD10TJ331	Carbon	330 ohms 1/8W
R75	ERD10TJ201	Carbon	200 ohms 1/8W
R76	ERD10TJ183	Carbon	18K ohms 1/8W
R77	ERD10TJ332	Carbon	3.3K ohms 1/8W
R78-80	ERD10TJ102	Carbon	1K ohms 1/8W
R81	ERD10TJ100	Carbon	10 ohms 1/8W
R82	ERD10TJ272	Carbon	2.7K ohms 1/8W
R83	ERD10TJ152	Carbon	1.5K ohms 1/8W
R84	ERD10TJ562	Carbon	5.6K ohms 1/8W
R85	ERD10TJ222	Carbon	2.2K ohms 1/8W
R86	ERD10TJ392	Carbon	3.9K ohms 1/8W
R87	ERD10TJ222	Carbon	2.2K ohms 1/8W
R88,89	ERD10TJ2R2	Carbon	2.2 ohms 1/8W
R90	ERD10TJ750	Carbon	75 ohms 1/8W
R91	ERD10TJ223	Carbon	22K ohms 1/8W
R92	ERD10TJ822	Carbon	8.2K ohms 1/8W
R93	ERD10TJ750	Carbon	75 ohms 1/8W
R94	ERD10TJ222	Carbon	2.2K ohms 1/8W
R95	ERD10TJ102	Carbon	1K ohms 1/8W
R97	ERD10TJ222	Carbon	2.2K ohms 1/8W
R98	ERD10TJ132	Carbon	1.3K ohms 1/8W
R99,100	ERD10TJ102	Carbon	1K ohms 1/8W
R101	ERD10TJ222	Carbon	2.2K ohms 1/8W
R102	ERD10TJ101	Carbon	100 ohms 1/8W
R103	ERD10TJ472	Carbon	4.7K ohms 1/8W
R112	ERD10TJ222	Carbon	2.2K ohms 1/8W
R113	ERD10TJ103	Carbon	10K ohms 1/8W
R114	ERD10TJ101	Carbon	100 ohms 1/8W
R115	ERD10TJ100	Carbon	10 ohms 1/8W
R116	ERD10TJ301	Carbon	300 ohms 1/8W
R117	ERD10TJ221	Carbon	220 ohms 1/8W
R118	ERD10TJ332	Carbon	3.3K ohms 1/8W
R119	ERD10TJ392	Carbon	3.9K ohms 1/8W
R120	ERD10TJ102	Carbon	1K ohms 1/8W
R121	ERD10TJ243	Carbon	24K ohms 1/8W
R122	ERD10TJ100	Carbon	10 ohms 1/8W
R123,124	ERD10TJ223	Carbon	22K ohms 1/8W
R125	ERD10TJ100	Carbon	10 ohms 1/8W
R126	ERD10TJ223	Carbon	22K ohms 1/8W
R127	ERD10TJ100	Carbon	10 ohms 1/8W
R128,129	ERD10TJ223	Carbon	22K ohms 1/8W
R130	ERD10TJ123	Carbon	12K ohms 1/8W
R131	ERD10TJ223	Carbon	22K ohms 1/8W
R132	ERD10TJ183	Carbon	18K ohms 1/8W
R133	ERD10TJ223	Carbon	22K ohms 1/8W
R134	ERD10TJ473	Carbon	47K ohms 1/8W
R135	ERD10TJ223	Carbon	22K ohms 1/8W
R136	ERD10TJ562	Carbon	5.6K ohms 1/8W
R137	ERD10TJ100	Carbon	10 ohms 1/8W
R138	ERD10TJ103	Carbon	10K ohms 1/8W
R139	ERD10TJ512	Carbon	5.1K ohms 1/8W
R140	ERD10TJ102	Carbon	1K ohms 1/8W
R141,142	ERD10TJ560	Carbon	56 ohms 1/8W
R143	ERD10TJ750	Carbon	75 ohms 1/8W
R144	ERD10TJ223	Carbon	22K ohms 1/8W
R149,150	ERD10TJ473	Carbon	47K ohms 1/8W
R151	ERD10TJ331	Carbon	330 ohms 1/8W
R152	ERD10TJ222	Carbon	2.2K ohms 1/8W

SYM-BOL NO.	PART NO.	DESCRIPTION	
R154	ERD10TJ224	Carbon	220K ohms 1/8W
R155	ERD10TJ122	Carbon	1.2K ohms 1/8W
R156	ERD10TJ152	Carbon	1.5K ohms 1/8W
R157,158	ERD10TJ183	Carbon	18K ohms 1/8W
R159	ERD10TJ152	Carbon	1.5K ohms 1/8W
R160	ERD10TJ222	Carbon	2.2K ohms 1/8W
R161	ERD10TJ243	Carbon	24K ohms 1/8W
R162	ERD10TJ103	Carbon	10K ohms 1/8W
R163	ERD10TJ122	Carbon	1.2K ohms 1/8W
R164	ERD10TJ152	Carbon	1.5K ohms 1/8W
R171	ERD10TJ102	Carbon	1K ohms 1/8W
R172	ERD10TJ472	Carbon	4.7K ohms 1/8W
R173	ERD10TJ100	Carbon	10 ohms 1/8W
R174	ERD10TJ104	Carbon	100K ohms 1/8W
R175	ERD10TJ222	Carbon	2.2K ohms 1/8W
R176	ERD10TJ100	Carbon	10 ohms 1/8W
R177	ERD10TJ222	Carbon	2.2K ohms 1/8W
R180	ERD10TJ821	Carbon	820 ohms 1/8W
R181	ERD10TJ183	Carbon	18K ohms 1/8W
R182	ERD10TJ223	Carbon	22K ohms 1/8W
R183	ERD10TJ101	Carbon	100 ohms 1/8W
R184	ERD10TJ562	Carbon	5.6K ohms 1/8W
R185	ERD10TJ512	Carbon	5.1K ohms 1/8W
R186	ERD10TJ102	Carbon	1K ohms 1/8W
R187,188	ERD10TJ560	Carbon	56 ohms 1/8W
R189	ERD10TJ750	Carbon	75 ohms 1/8W
R190	ERD10TJ223	Carbon	22K ohms 1/8W
R191	ER0S2CKF1003	Metal	100K ohms 1/8W
R192	ER0S2CKF3903	Metal	390K ohms 1/4W
R193	ERD10TJ243	Carbon	24K ohms 1/8W
R194	ER0S2CKF5101	Metal	5.1K ohms 1/8W
R195	ERD10TJ101	Carbon	100 ohms 1/8W
R196	ERD10TJ222	Carbon	2.2K ohms 1/8W
R197,198	ERD10TJ473	Carbon	47K ohms 1/8W
R199	ERD10TJ162	Carbon	1.6K ohms 1/8W
R200-202	ERD10TJ104	Carbon	100K ohms 1/8W
R203	ERD10TJ103	Carbon	10K ohms 1/8W
R204	ERD10TJ332	Carbon	3.3K ohms 1/8W
R205	ERD10TJ181	Carbon	180 ohms 1/8W
R206	ERD10TJ333	Carbon	33K ohms 1/8W
R207	ERD10TJ470	Carbon	47 ohms 1/8W
R208,209	ERD10TJ472	Carbon	4.7K ohms 1/8W
R210	ERD10TJ101	Carbon	100 ohms 1/8W
R211,212	ERD10TJ102	Carbon	1K ohms 1/8W
R213	ERD10TJ473	Carbon	47K ohms 1/8W
R214	ERD10TJ512	Carbon	5.1K ohms 1/8W
R215	ERD10TJ682	Carbon	6.8K ohms 1/8W
R216	ERD10TJ103	Carbon	10K ohms 1/8W
R217	ERD10TJ104	Carbon	100K ohms 1/8W
R218	ERD10TJ561	Carbon	560 ohms 1/8W
R219,220	ERD10TJ682	Carbon	6.8K ohms 1/8W
R221	ERD10TJ302	Carbon	3K ohms 1/8W
R222	ERD10TJ273	Carbon	27K ohms 1/8W
R223	ERD10TJ681	Carbon	680 ohms 1/8W
R224	ERD10TJ391	Carbon	390 ohms 1/8W
R225	ERD10TJ101	Carbon	100 ohms 1/8W
R226-233	ERD10TJ104	Carbon	100K ohms 1/8W
R234	ERD10TJ101	Carbon	100 ohms 1/8W
R235	ERD10TJ272	Carbon	2.7K ohms 1/8W
R236	ERD10TJ222	Carbon	2.2K ohms 1/8W
R237	ERD10TJ512	Carbon	5.1K ohms 1/8W
R238	ERD10TJ103	Carbon	10K ohms 1/8W
R239	ERD10TJ101	Carbon	100 ohms 1/8W
R240,241	ERD10TJ512	Carbon	5.1K ohms 1/8W
R242	ER0S2TKF3003	Metal	300K ohms 1/8W
R301	ERTD2FHL103S	Thermister	10K ohms
VR1	EVN8ACA00BQ4	Variable Resistor	47K ohms
VR4	EVN8ACA00B14	Variable Resistor	10K ohms
VR5	EVN8ACA00BQ3	Variable Resistor	4.7K ohms
VR6	EVN8ACA00BY4	Variable Resistor	33K ohms
VR7	YWH0651A6R8K	Variable Resistor	6.8K ohms
VR8	YWH0651A470	Variable Resistor	470 ohms
VR9	o EVJKBAS20B23	Variable Resistor	2K ohms
VR10	o EVJKBAS20B13	Variable Resistor	1K ohms
C1	ECEA1CK470	Electrolytic	47 μF 16V
C2	ECEA1CK100	Electrolytic	10 μF 16V
C3	ECQM1H104JZ	Plastic	0.1 μF 50V
C4	ECCF1H101JC	Ceramic	100 pF 50V
C5	ECQP1102JZ	Plastic	1000 pF 100V
C6	ECQM1H223JZ	Plastic	0.022 μF 50V
C7	ECQB1H103JZ	Plastic	0.01 μF 50V
C9	ECCF1H271JC	Ceramic	270 pF 50V
C13	ECCF1H060DC	Ceramic	6 pF 50V
C15,16	ECEA1CK100	Electrolytic	10 μF 16V
C17	ECEA1CSS221	Electrolytic	220 μF 16V
C18	ECQP1102JZ	Plastic	1000 pF 100V
C19	ECEA1CU101	Electrolytic	100 μF 100V
C20,21	ECEA1CSS221	Electrolytic	220 μF 16V
C22	ECEA1AU221	Electrolytic	220 μF 10V
C23	o ECEA1EF330V	Electrolytic	33 μF 25V
C25	ECEA1AK470	Electrolytic	47 μF 10V
C26	o ECCF1H331JC	Ceramic	330 pF 50V
C27	ECEA1CF221	Electrolytic	220 μF 16V
C28	ECEA1HK2R2	Electrolytic	2.2 μF 50V
C29	ECEA1CF101	Electrolytic	100 μF 16V
C30,31	ECEA0JK101	Electrolytic	100 μF 6.3V
C32	ECQV1H473JZ	Plastic	0.047 μF 50V
C33	ECEA1HKR22	Electrolytic	0.22 μF 50V
C34	ECQP1102JZ	Plastic	1000 pF 100V
C35	ECEA1CSS221	Electrolytic	220 μF 16V
C36	ECEA1AK470	Electrolytic	47 μF 10V
C37	ECEA1CN100S	Electrolytic	10 μF 16V
C38	ECEA1CSS221	Electrolytic	20 μF 16V
C39	ECEA1CN100S	Electrolytic	10 μF 16V
C40	ECEA1HNR47	Electrolytic	0.47 μF 50V
C41	ECEA1CN330S	Electrolytic	33 μF 16V
C42	ECEA1AU221	Electrolytic	220 μF 10V
C43	ECCF1H270JC	Ceramic	27 pF 50V
C44	ECEA1CK100	Electrolytic	10 μF 16V
C45	ECEA1ASS102	Electrolytic	1000 μF 10V
C46	ECEA1CU101	Electrolytic	100 μF 16V
C47	ECCF1H060DC	Ceramic	6 pF 50V
C52	ECEA1AK470	Electrolytic	47 μF 10V

SYMBOL NO.	PART NO.	DESCRIPTION	
C53	ECCF1H331JC	Ceramic	330 pF 50V
C54	ECCF1H121JC	Ceramic	120 pF 50V
C55	ECCF1H620JC	Ceramic	62 pF 50V
C56	ECCF1H120JC	Ceramic	12 pF 50V
C57	ECCF1H470JC	Ceramic	47 pF 50V
C58	ECCF1H240JC	Ceramic	24 pF 50V
C59-62	ECKF1H102KB	Ceramic	1000 pF 50V
C63	ECCF1H050DC	Ceramic	5 pF 50V
C64	ECEA1ASS102	Electrolytic	1000 µF 10V
C65	ECEA1CSS221	Electrolytic	220 µF 16V
C67	ECEA1AK470	Electrolytic	47 µF 10V
C68	ECEA1HK010	Electrolytic	1 µF 50V
C69	ECCF1H271JC	Ceramic	270 pF 50V
C70,71	ECKW1H222KB5	Ceramic	2200 pF 50V
C72	ECEA0JK101	Electrolytic	100 µF 6.3V
C73,74	ECEA1CK100	Electrolytic	10 µF 16V
C75	ECEA1ASS102	Electrolytic	1000 µF 10V
C76	ECEA1CK100	Electrolytic	10 µF 16V
C77-79	ECKF1H102KB	Ceramic	1000 pF 50V
C80	ECEA1HK0R1	Electrolytic	0.1 µF 50V
C81	ECEA1CK470	Electrolytic	47 µF 16V
C82	ECQB1H103JZ	Plastic	0.01 µF 50V
C83	ECEA1EK470	Electrolytic	47 µF 25V
C85	ECEA1CU101	Electrolytic	100 µF 16V
C86	ECEA1CU470	Electrolytic	47 µF 16V
C88	ECEA1AK470	Electrolytic	47 µF 10V
C89	ECEA0JK101	Electrolytic	100 µF 6.3V
C90,91	ECQM1H104JZ	Plastic	0.1 µF 50V
C92	ECEA1CU470	Electrolytic	47 µF 16V
C93	ECEA1AK470	Electrolytic	47 µF 10V
C94	ECEA1AU471	Electrolytic	470 µF 10V
C95	ECCF1H101J	Ceramic	100 pF 50V
C96	ECQB1H103JZ	Plastic	0.01 µF 50V
L1	YFPC470K	Coil	47 µH
L2	YFPF331K	Coil	330 µH
L3	YFPC470K	Coil	47 µH
L4	EL05SI470K	Coil	47 µH
L5,6	YWL5150J	Coil	15 µH
SW2	YFSBU1024	Rotary Switch	
SW3	YWSSS21200	Slide Switch	
F1	ICPF25	Current Fuse	25A
J96	ERD25TC0	Jumper Resistor	
CN1,2-JM	S2PS2T2EF	2 pin Jack Male	
CN3-JM	YFILG3PS3T2E	3 pin Jack Male	
CN4-JM	YFILG2PS3T2E	2 pin Jack Male	
CN5-JM	S2PS2T2EF	2 pin Jack Male	
CN6-JM	YFS7PS2T2EF	7 pin Jack Male	
CN7-JM	YFS8PS2T2EF	8 pin Jack Male	
CN8-10-JM	S2PS2T2EF	2 pin Jack Male	
CN11-JM	S3PS2T2EF	3 pin Jack Male	
CN12-JM	S5PS2T2EF	5 pin Jack Male	
CN13-JM	YFS8PS2T2EF	8 pin Jack Male	
CN14-JM	YFS7PS2T2EF	7 pin Jack Male	
CN15-JM	S5PS2T2EF	5 pin Jack Male	
CN16-JM	S4PS2T2EF	4 pin Jack Male	

SYMBOL NO.	PART NO.	DESCRIPTION
CN17-JM	S2PS2T2EF	2 pin Jack Male
CN18-JM	S4PS2T2EF	4 pin Jack Male
CN19-JM	YFS6PS2T2EF	6 pin Jack Male
CN20-JM	S5PS2T2EF	5 pin Jack Male
CN21-JM	YFS6PS2T2EF	6 pin Jack Male
M31	o YFV2SA0215A4	Earth Lag
M32	YFV2HA0219A4	Shield Cover A
M33	YFV2HA0220A4	Shield Case
M34	YFV2HA0221A4	Shield Cover B
M35	o YFV2SA0214A4	Mounting Angle for VR

PANEL BOARD

PCB4	o YFVKZRC33P2A	Printed Circuit Board Assy	
VR1-5	YFK12G10KBNC	Variable Resistor	10K ohms
VR6	EVJ1KAS10B14	Variable Resistor	10K ohms
SW1-3	YFSSA042L12	Slide Switch	
SW4	YFSSA043L12	Slide Switch	
SW5	YFMTK3103P-G	Toggle Switch	
SW6	YFMTK3105P-G	Toggle Switch	
SW7	YFME3108P-G	Toggle Switch	
SW8, 9	YFSPH222A	Push Switch	

ACCESSORY PARTS/PACKAGING PARTS

CN50	YFCNR-1204P	4 pin Connector
M18	YWB350-HM01	Handle
M19	YWU-L88HA	Ruck Angle
M51	o YFV8QA0917AN	Operating Instruction for WV-RC33/ BCG
	o YFV8QA0918AN	Operating Instruction for WV-RC33 NA
M52	19998700331	Warranty Card for WV-RC33/B
	19998700419	Warranty Card for WV-RC33/G
M55	YWT050803	Polyethylene Bag for Mounting Screw
M56	YWT20X35C03	Polyethylene Bag for Ruck Angle
M57	XZB26X40C05	Polyethylene Bag for Printed
M58	XZB45X63C05	Polyethylene Bag for RCU
M59	YWT15X20C03	Polyethylene Bag for Cord
M61	o YFV9CB0726AN	Packaging
M62	o YWS-SNPRB06	Packing Label A
M63	YFV8FA0004A3	Packing Label B for WV-RC33/BCG BCG
	YNL2E	Packing Label B for WV-RC33N, NA

WV-VF65 5" VIEWFINDER

MISCELLANEOUS

SYMBOL NO.	PART NO.	DESCRIPTION
V1 ⚠	M13JEE5WW	Cathode Ray Tube
VR1,2	EVHC0AK15B53	Variable Resistor 5K ohms
VR2	EVHC0AK15B54	Variable Resistor 50K ohms
L5 ⚠	YFYS33418	Deflection coil
SW1,2	YFM2012ESG	Selector Switch
PL1	YWSQG1012V12	Tally Lamp
CN10	YWS7-502B-40	CRT Socket Assy
CN13	YWM20201A	Tally Lamp Socket
E501	o YF8P65CABLE	Power Cable
M501	YFV5EC0063A3	Upper Cover
M502	YWV3805CM01	Chassis A for Circuit Board
M503	o YFV5YA0013A4	Band for CRT
M504	YFV2SA0101A4	Mounting Angle for CRT (x2)
M505	YWV3805DR01	Rear Escutcheon
M506	YWV3805LM02	Rear Nut Plate (x2)
M507	YWV930-LM01	Supporting Angle
M508	YWV385PKR01V	Tally Cover
M509	YWV385PLR01U	Tally Card
M510	YWV3805AM02	Reflection Plate for Tally
M511	YFV5EC0067B2	Front Cover
M512	YWV3805CM02	Chassis B for Power Board
M513	YFV5EC0064A2	Lower Cover
M514	o YFV1KA0001A4	Polyethylene Washer
M518	YWSR5N4	Cord Clamp
M519 ⚠	o YFV7QA0933A4	Main Label for WV-VF65E
⚠	o YFV7QA0934A4	Main Label for WV-VF65N
M520 ⚠	YFV7MA0099A4	Caution Atention Label
M522 ⚠	YWS-XEGRB03A	X-Ray Label for WV-VF65E
M523	YWS-LM010A	Panasonic Badge for WV-VF65E
	YWS-LM011A	National Badge for WV-VF65N
M524	YFBE-40	Retaining Ring (x3)
M525	YFV2CB0019A4	Hold Plate
M526	YFV2NA0009A4	Mounting Frame Spacer (x2)
M527	YFV2TA0054A4	Mounting Bracket
M528	YFV2NA0008A4	Spacer for Frame (x3)
M529	o YFV2WA0017A3	Upper Mounting Frame
M530	o YFV2WA0018A3	Lower Mounting Frame
M531	YFV5RA0014A3	Knob A for Pan Bracket (x2)
M532	YFV5RA0015A3	Knob B for Tilt Bracket
M533	YWV1800FR03	Polyethylene Washer
M534	YFV1BA0003A4	Support for Frame
M535	YFV1BA0004A4	Support for Mounting Bracket
M539	YWV3805LB01	Spacer for Shield Case
M545 ⚠	YFV7MA0204A4	X-Ray Label for WV-VF65E
M546 ⚠	YWS-WULRB01A	High Voltage Caution Label
M549	YWV3805FM01	Special Screw

VF DEFLECTION BOARD

SYMBOL NO.	PART NO.	DESCRIPTION	
PCB501	o YFVKBVF65E1A	Printed Circuit Board Assy	
IC202	AN5750	IC	
Q100	2SD636-R	Transistor	
Q101	2SB641-RS	Transistor	
Q102	2SD636-R	Transistor	
Q103	2SC1226A-Q	Transistor	
Q104	2SA684-Q	Transistor	
Q202	2SB641-RS	Transistor	
Q203	2SD636-R	Transistor	
Q206	2SD772B	Transistor	
Q207	2SD1205-R	Transistor	
D100,101	MA161	Diode	
D102	MA165	Diode	
D206	MA4068M	Diode	
D207	YUDERB24-04C	Diode	
D208	YUDU06C	Diode	
D209	0A91	Diode	
D210-213	YUDERB24-04C	Diode	
TH100	ERTD2FHL503S	Thermistor	50K ohms
TH101	ERTD2FBK111S	Thermistor	110 ohms
R101	ERD10TJ103	Carbon	10K ohms 1/8W
R102	ERD10TJ222	Carbon	2.2K ohms 1/8W
R103	ERD25FJ270	Carbon	27 ohms 1/4W
R104	ERX1ANJR68	Metal	0.68 ohms 1W
R105	ERD10TJ621	Carbon	620 ohms 1/8W
R106	ERD10TJ103	Carbon	10K ohms 1/8W
R107	ERD25FJ182	Carbon	1.8K ohms 1/4W
R108	ERD25FJ681	Carbon	680 ohms 1/4W
R110	ERD25FJ222	Carbon	2.2K ohms 1/4W
R111	ERD25FJ470	Carbon	47 ohms 1/4W
R112	ERD25FJ122	Carbon	1.2K ohms 1/4W
R113	ERD25FJ331	Carbon	330 ohms 1/4W
R114	ERD25FJ121	Carbon	120 ohms 1/4W
R115,116	ERX2ANJR56	Metal	0.56 ohms 2W
R221	ERD10TJ332	Carbon	3.3K ohms 1/8W
R222	ERD10TJ102	Carbon	1K ohms 1/8W
R223	ERD10TJ222	Carbon	2.2K ohms 1/8W
R224	ERD10TJ103	Carbon	10K ohms 1/8W
R225	ERD10TJ472	Carbon	4.7K ohms 1/8W
R226	ERD10TJ101	Carbon	100 ohms 1/8W
R227	ERD10TJ153	Carbon	15K ohms 1/8W
R228	ERG1ANJ470	Metal	47 ohms 1W
R229	ERX1ANJR56	Metal	0.56 ohms 1W
R230	ERD10TJ561	Carbon	560 ohms 1/8W

SYM-BOL NO.	PART NO.	DESCRIPTION	
R231	ERD10TJ682	Carbon	6.8K ohms 1/8W
R232	ERD10TJ153	Carbon	15K ohms 1/8W
R235	ERD10TJ103	Carbon	10K ohms 1/8W
R236	ERD10TJ911	Carbon	910 ohms 1/8W
VR100	YFH1021A4R7K	Variable Resistor	4.7K ohms
VR102,103	YFCR19R1KB	Variable Resistor	1.0K ohms
VR202	EVN8ACA00BE3	Variable Resistor	2.2K ohms
VR203	YFH1621C1MB	Variable Resistor	1M ohms
C100	ECEA1CS220	Electrolytic	22 μF 16V
C101,102	ECSF1CE156	Electrolytic	15 μF 16V
C103	ECQV05104JZ	Plastic	0.1 μF 50V
C104	ECQV1H274JZ	Plastic	0.27 μF 50V
C105	ECQP1821JZ	Plastic	820 pF 100V
C106	ECEA1CS101	Electrolytic	100 μF 16V
C107	ECEA0JS222	Electrolytic	2200 μF 6.3V
C212	ECEA1ASS471	Electrolytic	470 μF 10V
C213	ECCF1H101JC	Ceramic	100 pF 50V
C214,215	ECQM1H153JZ	Plastic	0.015 μF 50V
C216	ECQM1H273JZ	Plastic	0.027 μF 50V
C217	ECEA1HS010	Electrolytic	1 μF 50V
C218,219	ECQP1392JZ	Plastic	3900 pF 100V
C220	ECEA1HS010	Electrolytic	1 μF 50V
C221	ECEA1AS101	Electrolytic	100 μF 10V
C222	ECQM1H153JZ	Plastic	0.015 μF 50V
C224	ECEA1CSS100	Electrolytic	10 μF 16V
C225	ECCF1H151JR	Ceramic	150 pF 50V
C226 ⚠	ECQM2473KZ	Plastic	0.047 μF 200V
C227	ECEA25W10Z	Electrolytic	10 μF 25V
C228,229	ECEA2CS100	Electrolytic	10 μF 160V
C230	ECEA2WS010	Electrolytic	1 μF 450V
C231	ECEA2AS100	Electrolytic	10 μF 100V
C234	ECEA1ASS222	Electrolytic	2200 μF 10V
C235	ECEA1AS101	Electrolytic	100 μF 10V
C237	ECEA25W10Z	Electrolytic	10 μF 25V
L3 ⚠	ELH16F753	Coil	22.5 μH
L4 ⚠	ELH5L18	Coil	
T200 ⚠	ETF35L14V	Flyback Transformer	
T201	TLH3412K	Low Freq Transformer	
CN5-JM	EMCS0352M	3 Pin Jack Male	
CN6-JM	EMCS0452M	4 Pin Jack Male	
CN7-JM	EMCS0352M1G	3 Pin Jack Male	
CN8-JM	EMCS0252M	2 Pin Jack Male	
CN9-JM	EMCS0252M1R	2 Pin Jack Male	
M536	YFV2HA0054A3	Shield Cover A	
M537	YFV2HA0055A4	Shield Case A	
M538	YFV2PA0070A4	Insulator Sheet	

SYM-BOL NO.	PART NO.	DESCRIPTION	
VF VIDEO AMPLIFIER BOARD			
PCB502	o YFVKCVF65E1A	Printed Circuit Board Assy	
Q1,2	2SD636-R	Transistor	
Q3	2SB641-RS	Transistor	
Q4	2SD636-R	Transistor	
Q5	2SC1216F	Transistor	
Q6	2SC2258	Transistor	
Q7	2SA1018A	Transistor	
Q8	2SB641-RS	Transistor	
Q9	2SD636-R	Transistor	
Q10	2SD661-STU	Transistor	
D1,2	MA161	Diode	
D3	MA162	Diode	
D4	YUDERB24-04C	Diode	
D5	0A91	Diode	
R1,2	ERD10TJ563	Carbon	56K ohms 1/8W
R3	ERD10TJ102	Carbon	1K ohms 1/8W
R4,6	ERD10TJ222	Carbon	2.2K ohms 1/8W
R7	ERD10TJ183	Carbon	18K ohms 1/8W
R8	ERD10TJ563	Carbon	56K ohms 1/8W
R9	ERD10TJ102	Carbon	1K ohms 1/8W
R10	ERD10TJ561	Carbon	560 ohms 1/8W
R11	ERD10TJ151	Carbon	150 ohms 1/8W
R12	ERD10TJ152	Carbon	1.5K ohms 1/8W
R14	ERD10TJ562	Carbon	5.6K ohms 1/8W
R15	ERD10TJ103	Carbon	10K ohms 1/8W
R16	ERD10TJ331	Carbon	330 ohms 1/8W
R17	ERD25FJ391	Carbon	390 ohms 1/4W
R18	ERD25FJ820	Carbon	82 ohms 1/4W
R19	ERD10TJ681	Carbon	680 ohms 1/8W
R20	ERD10TJ472	Carbon	4.7K ohms 1/8W
R21	ERD10TJ332	Carbon	3.3K ohms 1/8W
R22,23	ERD10TJ822	Carbon	8.2K ohms 1/8W
R24	ERG2ANJ103	Metal	10K ohms 2W
R25	ERG1ANJ102	Metal	1K ohms 1W
R26	ERD10TJ104	Carbon	100K ohms 1/8W
R28	ERD10TJ273	Carbon	27K ohms 1/8W
R29	ERD25FJ473	Carbon	47K ohms 1/4W
R30	ERD25FJ333	Carbon	33K ohms 1/4W
R31	ERD10TJ391	Carbon	390 ohms 1/8W
R32	ERD10TJ563	Carbon	56K ohms 1/8W
R33	ERD10TJ224	Carbon	220K ohms 1/8W
R34	ERD10TJ101	Carbon	100 ohms 1/8W
R35	ERD10TJ272	Carbon	2.7K ohms 1/8W
R36	ERD10TJ332	Carbon	3.3K ohms 1/8W
R37	ERD10TJ102	Carbon	1K ohms 1/8W
R38	ERD10TJ472	Carbon	4.7K ohms 1/8W
R39	ERD10TJ272	Carbon	2.7K ohms 1/8W
R41	ERD10TJ121	Carbon	120 ohms 1/8W
R42	ERD10TJ752	Carbon	7.5K ohms 1/8W
R43	ERD10TJ103	Carbon	10K ohms 1/8W
R44	ERD10TJ301	Carbon	300 ohms 1/8W
R45	ERD10TJ103	Carbon	10K ohms 1/8W
R46	ERD10TJ122	Carbon	1.2K ohms 1/8W

SYM-BOL NO.	PART NO.	DESCRIPTION	
R221	ERD10TJ153	Carbon	15K ohms 1/8W
VR3	YWSR19R680KB	Variable Resistor	680K ohms
C1	ECEA1CS470	Electrolytic	47 μF 16V
C2,3	ECEA1AS101	Electrolytic	100 μF 10V
C4	ECEA1CS470	Electrolytic	47 μF 16V
C6	ECKF1H391KB	Ceramic	390 pF 50V
C8	ECEA1AS471	Electrolytic	470 μF 10V
C9	ECEA1CN100S	Electrolytic	10 μF 16V
C10	ECEA1AS101	Electrolytic	100 μF 10V
C11	ECQP1122JZ	Plastic	1200 pF 100V
C13	ECEA1CSS100	Electrolytic	10 μF 16V
C14	ECEA0JS101	Electrolytic	100 μF 6.3V
C16	ECEA2CS010	Electrolytic	1 μF 160V
C17	ECQM1H333KZ	Plastic	0.033 μF 50V
C18	ECEA1HS010	Electrolytic	1 μF 50V
C19	ECEA1AS101	Electrolytic	100 μF 10V
C20,21	ECQM1H223JZ	Plastic	0.022 μF 50V
C23	ECEA1AS221	Electrolytic	220 μF 10V
C24	ECEA1HS010	Electrolytic	1 μF 50V
C25	ECQV1H563JZ	Plastic	0.056 μF 50V
C27	ECQB1H103JZ	Plastic	0.01 μF 50V
C29	ECEA2CS100	Electrolytic	10 μF 160V
C30	ECEA1ASS102	Electrolytic	1000 μF 10V
C32	ECKF1H331KB	Ceramic	330 pF 50V
C33	ECEA1HSS220	Electrolytic	22 μF 50V
C34	ECCF1H101JC	Ceramic	100 pF 50V
L1	YFL5680J	Coil	68 μH
L2	YWL5220J	Coil	22 μH
J40	ERD10TJ0	Jumper Resistor	
CN2-JM	YFILG3PS3T2E	3 Pin Jack Male	
CN3-JM	EMCS0352M	3 Pin Jack Male	
CN4-JM	EMCS0552M	5 Pin Jack Male	
E1	o WMT4X1R2X7	Insulator	
E2	o WMT6X1R2X5	Insulator	
M515	YFV5WA0060A3	Control Panel	
M516	YFV2SA0046A4	Mounting Angle for VR	
M517	YWV3801HR01	Knob for Control (x2)	

LED BOARD

SYM-BOL NO.	PART NO.	DESCRIPTION
PCB503	o YFVKDVF65P1A	Printed Circuit Board Assy
D214	LN23L	LED
M548	YWE2400FR01	LED Holder

POWER BOARD

SYM-BOL NO.	PART NO.	DESCRIPTION	
PCB504	o YFVKZVF65P1A	Printed Circuit Board Assy	
IC1	NJM2048MC	IC	
Q1	2SD637-RS	Transistor	
Q2	2SB642-QRS	Transistor	
Q3	2SD637-RS	Transistor	
Q4	2SB642-QRS	Transistor	
Q5,6	2SB929-PQ	Transistor	
Q7	2SB793-RS	Transistor	
Q8	2SD1205-R	Transistor	
Q9	2SD636-Q	Transistor	
D1,2	EK14	Diode	
R1	ERD10TJ682	Carbon	6.8K ohms 1/8W
R2	ERD10TJ273	Carbon	27K ohms 1/8W
R3	ERD10TJ682	Carbon	6.8K ohms 1/8W
R4	ERD10TJ182	Carbon	1.8K ohms 1/8W
R5	ERD10TJ102	Carbon	1K ohms 1/8W
R6,7	ERD10TJ682	Carbon	6.8K ohms 1/8W
R8,9	ERD10TJ102	Carbon	1K ohms 1/8W
R10	ERD10TJ333	Carbon	33K ohms 1/8W
R11	ERD10TJ104	Carbon	100K ohms 1/8W
R12	ERD10TJ102	Carbon	1K ohms 1/8W
R13	ERD10TJ103	Carbon	10K ohms 1/8W
R14	ERD10TJ472	Carbon	4.7K ohms 1/8W
R15	ERD10TJ102	Carbon	1K ohms 1/8W
R16	ERD10TJ103	Carbon	10K ohms 1/8W
VR1	YWH0651A6R8K	Variable Resistor	6.8K ohms
VR2	H0621A33K	Variable Resistor	33K ohms
VR3	EVN8ACA00BE3	Variable Resistor	2.2K ohms
C1	ECEA1EK3R3	Electrolytic	3.3 μF 25V
C2	ECEA1EF330	Electrolytic	33 μF 25V
C3	ECEA1ASS470	Electrolytic	47 μF 10V
C4	ECCF1H331J	Ceramic	330 pF 50V
C5	ECQB1H103JZ	Plastic	0.01 μF 50V
C6	ECEA1CSS221	Electrolytic	220 μF 16V
C7	ECEA1AF101	Electrolytic	100 μF 10V
C8	ECQB1H103JZ	Plastic	0.01 μF 50V
C9	ECEA1CSS221	Electrolytic	220 μF 16V
C10	ECEA1CF101	Electrolytic	100 μF 16V
C12	ECEA1HSSR22	Electrolytic	0.22 μF 50V
L1	YFPC470K	Coil	47μH
L2	YFPF331K	Coil	330 μH
L3	YFPC470K	Coil	47μH
L4	YFPF331K	Coil	330 μH
L5	YFPC470K	Coil	47μH
F1,2	ICPF25	Current Fuse	1A50V
F3 ⚠	YFSP520NM0	Current Fuse	2A1 25V
CN1-JM	S4PS2T2EF	4 Pin Jack Male	
CN2-JM	YFS6PS2T2EF	6 Pin Jack Male	
M543	YFV2HA0232A4	Shield Case B	
M544	YFV2HA0233A4	Shield Cover B	

ACCESSORY PARTS/PACKAGING PARTS

SYMBOL NO.	PART NO.	DESCRIPTION
PL1	YWSQG1012V12	Tally Lamp
M550	YFV5MA0011A4	Shoe
M551	YFV6BA0015A3	Hood
M552	YWV3805FM01	Mounting Screw for Hood
M553	o YFV8QA0902AN	Operating Instructions for WV-VF65E
	o YFV8QA0903AN	Operating Instructions for WV-VF65N
M556	YWV385PLR02U	Tally Card No. 1
M557	YWV385PLR03U	Tally Card No. 2
M558	YFV5MA0020A4	Mounting Angle
M563	XZB26X40C05	Polyethylene Bag for Connector
M564	XZB35X50C05	Polyethylene Bag for 5" EVF
M559	YWT10X10C03	Polyethylene Bag for Screws
M560	YWT10X16C03	Polyethylene Bag for Tally Card and Lamp
M561	YWT20X25C03	Polyethylene Bag for Printed Matter
M562	YWT20X35C03	Polyethylene Bag for Hood
M565	o YFV9CA0339AN	Packaging
M566	YFV8FA0004A3	Packing Label for WV-VF65E
	YNL2E	Packing Label for WV-VF65N

WV-PS60 BATTERY PACK

MISCELLANEOUS

SYMBOL NO.	PART NO.	DESCRIPTION
BAT1	YFP18RF25G8	Battery Assy
CN1	YWQMA1221B	Battery Plug
M1	YFV5EA0248A2	Upper Cover
M2	YFV5EA0249A2	Bottom Cover
M3	YFV3BA0004A3	Mounting Base for Battery
M4	YFV2FA0091A4	Cushion A for Battery
M5	YFV2FA0092A4	Cushion B for Battery
M6	YFV2TA0053A4	Mounting Plate for Cord Bushing
M7	YFSR-2P-4	Cord Bushing
M8	YFV4JA0082A4	Spring Plate for Shue
M9	YFV5MA0013A4	Shue for Battery Pack
M10	YFV1HA0016A4	Stopper Pin
M11	YFV4JA0084A4	Spring A for Stopper Pin
M12	YFV4RA0009A4	Lock Lever
M13	YFV6JA0012A4	Lock Knob
M14	YFV4JA0083A4	Spring B for Lock Lever
M15 ⚠	o YFV7QC0629A4	Main Label
M16	YFV7MA0194A4	Charge Label
M17	YFV7SA0265A4	Caution Label

ACCESSORY PARTS/PACKAGING PARTS

SYMBOL NO.	PART NO.	DESCRIPTION
M21	o YFV8QA0858AN	Operating Instruction
M22	YWT20X35C03	Polyethylene Bag
M23	YFV9CA0504AN	Packaging